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## INDIAN EDUCATIONAL REVIEW

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  - 5 Letters to the Editor on important research problems.

The emphasis is on categories 2, 3, 4 and 5. Ordinarily, a paper is not accepted if it has appeared in print or in any form elsewhere. Exceptions may be made for contribution which the

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(Contd. on cover iii)

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## Organisational Effectiveness in a University: Impact of Personal Characteristics of Managers

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ORGANISATIONS are an integral part of our life. All of us are born in organisations, mature up in them and finally win our daily bread through working in them. All the activities of any enterprise are initiated and determined by the persons who make up that institution. Every aspect of an institution is determined by the competence, motivation, satisfaction and general effectiveness of its human organisation. Effectiveness is the ability of an organisation to mobilise its centres of power for action, production and adaptation. Different researchers have developed different measures to study effectiveness.

For achieving effective functioning, an organisation should establish moderately high goals, work through highly motivated and satisfied human force and be flexible and adaptable to its changing environment. Organisational effectiveness cannot be measured on a single evaluative dimension. In fact, it can be evaluated on the basis of multi-dimensional relationships of various components of an organisation. Campbell has formed as many as thirty criteria for measuring effectiveness. Organisational activities are numerous and encompass environment, internal operational aspect and behavioural dynamics of the people working in it. The selection of evaluative criteria depends upon the nature of an organisation.

Like any other organisation, university is run by human force. University can be described as a humanistically-oriented, complex, corporate organisation, with varied functions to perform. According to Singhal (1975), universities and colleges are complex but important social organisations reflecting a stable institutional history and internal consciousness. These organisations face the same type of problems as are faced by other complex organisations relating to their governance, planning, financial, management, leadership, inter-personal and group relationships, unionization and ecology, etc.

Lakshmi, Roy and Yadav (1988) pointed out the dynamic quality required in both dimensions of management process, namely decision-making and information flow, within and across such varied substructures of a university. Effective management lies in the extent to which 'diffused authority' is mobilised actively and channelised, through generating participatory interaction between the academic 'authority' and 'formalised' official leadership roles in 'decision-making'. In other words, the issue for management is to maintain the structural effectiveness through the dichotomous foci of 'decentralised responsibility' and 'centralised control'. 'Leadership' to educational personnel has certain unique demands. 'Effective leadership' not necessarily lies in how meticulously a manager insists on adhering to regulation but also in the meaningful and discerning interpretation he makes of the regulation which permits certain latitude for the personnel to operate freely and flexibly.

## REVIEW OF LITERATURE

The research on organisational effectiveness in a university has been sketchy and rather diffused. It was Chester Barnard (1948) who pointed out that to be effective, an organisation must persuade the individual member so that his personal interests are in accordance with, and will be furthered by, the interests and objectives of the employing organisation. Parsons (1956), McGregor (1960), Blake and Mouton (1964), Caplow (1964), Hill (1969), March (1980) and

Nagarajan (1986) have emphasized the integration of personal goals with those of the organisation.

Attitude of the members involved in the organisation is an important aspect for determining effectiveness of the organisation. Likert (1967), Dunnette (1967), Porter and Steers (1973), Ahuja (1979), Daly (1981) and Nagarajan (1986) have dealt with the internal state of an organisation. Khan (1971), Lawler (1982), and Devadoss (1984), linked high involvement with high organisational effectiveness. Motivation factor was taken up by Knopp and O. Reilly (1978), March (1980), Lawler (1982), Krackower (1985) and Taylor (1987). Effect of personal characteristics on perception of effectiveness was studied by Payne and Pugh (1976) and Kleemann (1984). Researchers like Burns and Stalker (1961), Caplow (1964), Friedlander and Pickle (1968), Campbell (1973), Gibson, Ivancevich and Donnelly (1976), Knopp and O. Reilly (1978), and McCoy (1987) have taken up satisfaction as one of the measures.

Likert (1961), Argyris (1972) and others believed that a decentralised, participative form of organisation is most conducive to effectiveness. Singh (1971) and Khan (1971) have advocated decentralisation and delegation of powers in university administration. Stratum and Schwartz (1970), centralisation which is considered conducive to organisational effectiveness in other organisations is treated as retarder of creativity in university.

Managerial quality, according to Lawler (1982), Carroll and Gillen (1985), had more impact in organic organisations. Knopp and O. Reilly (1978), Whetten and Cameron (1984), McCoy (1987), and Lakshmi, Roy and Yadav (1988) held the view that supportive leadership increased organisational effectiveness.

## OBJECTIVES

The study strived to achieve the following objectives:

1. To study the level of organisational effectiveness as perceived by managers of different age-groups, experience and education levels.
2. To compare the effectiveness level as perceived by managers of academic and non-academic background.
3. To examine the impact of education on the degree of effectiveness as perceived by academic and non-academic managers.

## RESEARCH METHOD

In order to realise the objectives of the study, primary data were collected from 50 managers of a university. University manager was a person who was involved

in decision-making, supervision, planning, controlling, organising and communication functions in either of the academic or non-academic areas of university administration. This was a census study including Vice-Chancellor, Registrar, Deans, Chairpersons, Deputy Registrars, Assistant Registrars, Executive Engineers and Assistant Engineers.

The data were collected through a questionnaire especially designed to suit the requirements of university functioning. It included seven dimensions of effectiveness, namely, adaptability and flexibility, satisfaction and morale, communication, decentralisation and accountability, leadership, control and performance. These dimensions were identified on the basis of review of literature and discussions held with experts. Five-point Likert Scale was utilised for collecting responses on different elements of each dimension of effectiveness. In all, 39 elements were included under seven dimensions of effectiveness.

The scores on each dimension carried their respective value and each dimension independently yielded a score ranging from 3 to 60. By assigning proportionate weightage to each dimension, equalisation factor was achieved. The overall effectiveness was determined by an algebraic summation of various dimension scores. These values varied from 39 to 195. The questionnaire was tested for its validity and reliability on a group of university managers.

The data were analysed for different variables in terms of means and standard deviation. To facilitate comparison, the data were initially classified into required groups. To test the level of significance, t-test was carried out. The first order correlation was carried out to find out the pattern of inter-correlation of various effectiveness dimensions with the personal characteristics of academic and non-academic managers, and the level of significance was also tested.

## FINDINGS

The findings of the study presented below are based on Tables 1 and 2.

1. The differences of mean scores in case of both highly qualified and low qualified managers, on adaptability and flexibility, communication, decentralisation and accountability elements of effectiveness and total effectiveness were found to be significant at .01 level of significance. Mean differences of leadership and performance factors were found to be significant at .05 level. And factors which did not show significant mean differences were satisfaction and morale, and control. Mean values of post-graduate and below group were more than those of the highly qualified group.

This led to the conclusion that not much difference in opinion was observed in the satisfaction and morale of the highly qualified group and the other group.

TABLE I  
Perceived Organisational Effectiveness and Personal Characteristics of University Managers

S.No.	Selected variables and effectiveness	Educational Qualifications						Age						Background			
		Highly qualified, Ph.D. and above			Post-graduate and below			50 and above 50 years			Below 50 years			Academic administrators		Non-academic administrators	
		N = 15			N = 35			N = 23			N = 27			N = 20		N = 30	
		Mean	SD	T-value	Mean	SD	T-value	Mean	SD	T-value	Mean	SD	T-value	Mean	SD	Mean	T-value
1.	Adaptability and flexibility	28.32	6.08	3.66*	37.58	8.93		35.27	10.19	0.33	34.40	8.18		31.08	7.90	37.28	2.46**
2.	Satisfaction and morale	31.27	7.23	1.84	35.69	7.98		35.09	7.32	0.60	33.74	8.41		33.70	8.75	34.80	0.47
3.	Communication	27.00	7.35	3.32*	34.54	7.36		30.91	8.32	1.12	33.44	7.65		29.10	8.22	34.40	2.38**
4.	Leadership	28.53	11.85	2.42**	36.46	10.08		31.65	10.54	1.46	36.15	11.18		30.60	11.61	36.40	1.85
5.	Decentralisation and accountability	27.04	6.87	2.74*	34.42	9.38		29.74	9.27	1.76	34.31	8.78		29.64	8.18	33.92	1.63
6.	Control	26.60	9.54	1.97	33.26	11.51		29.48	10.42	1.04	32.78	11.77		29.40	10.97	32.50	0.95
7.	Performance	31.47	7.81	2.06**	36.80	8.62		34.52	8.81	0.51	35.78	8.49		33.70	8.35	36.20	0.99
8.	Total effectiveness	200.23	42.37	3.19*	249.02	52.19		226.66	53.33	0.94	240.96	53.41		217.22	52.97	245.82	1.88

\*\*  $p < .05$  \*  $p < .01$

TABLE 2  
Correlation Matrix of Selected Variables and Personal Characteristics of Academic and Non-academic Groups

S.No.	Selected Variables and Effectiveness	Educational Qualifications		Age		Experience	
		AG	NG	AG	NG	AG	NG
1.	Adaptability and flexibility	-.60*	.18	-.26	.21	-.28	-.09
2.	Satisfaction and morale	-.49**	-.11	-.15	.22	-.15	-.004
3.	Communication	-.42	.06	-.16	.06	-.37	.04
4.	Leadership	-.30	-.07	-.33	-.15	-.40	-.21
5.	Decentralisation and accountability	-.59*	-.02	-.36	-.17	-.41	-.0008
6.	Control	-.46*	.16	-.39	-.10	-.41	-.01
7.	Performance	-.39	-.04	-.12	-.09	-.22	-.12
8.	Total effectiveness	-.55**	.04	-.32	-.02	-.40	-.07

AG = Academic Group (20); NG = Non-academic Group (30); \*  $p < .05$ ; \*\*  $p < .01$

Perception on control factor was also not different. Greater variations of views occurred in case of adaptability and flexibility, communication, leadership, decentralisation and accountability, performance and total effectiveness. Managers with lower qualifications tended to give more weightage to these factors than the highly qualified group. Comparatively they perceived greater adaptability, communication, leadership, decentralisation, performance and effectiveness in the organisation.

2. Generally, age factor is considered as an important aspect which accounts for difference in perceptions of the managers. Here, in this study, it was observed that differences in age did not account for different perceptions. Mean differences between the two groups were not significant. However, it was observed that mean score of adaptability and flexibility, and satisfaction and morale dimensions showed greater value for above 50 years age-group. Whereas, communication, leadership, decentralisation and accountability, control, performance and total effectiveness mean values were greater for below 50 years age-group.

Both below 50 years age-group and above 50 years age-group did not differ significantly on the views regarding perception of selected effectiveness dimensions and overall effectiveness. Mean values of above 50 years age-group showed that they held more positive views on the satisfaction and adaptability concept. Elder the age-group, the greater was the complacency and the lesser was the desire for conflict and confrontation. Younger managers perceived greater, communication, decentralisation and accountability, performance, control, leadership and overall effectiveness.

3. It has been attempted to identify whether the academic or non-academic background of an individual affects his perception towards the organisation or not. The total mean score on organisational effectiveness in terms of background did not differ significantly. But on the basis of distinction between the academicians and non-academicians, certain individual factors were found to be significant. The mean differences of the dimensions which were found to be significant were adaptability and flexibility, and communication network. They were significant at .05 level. Non-academic administrators depicted greater mean values for the selected variables.

Difference in degree of perception was significant. The managers with non-academic background were of the view that their organisation was more adaptable and flexible. Also, they viewed communication as a positive point towards effective organisation. In satisfaction and morale, leadership, decentralisation and accountability, control, performance and total effectiveness dimension, differences in degree of perception were not observed. Both academic and non-academic groups attached equal weightage to these factors.

4. In the academic group, adaptability and flexibility, decentralisation and accountability, and control showed significantly negative relationship with that of educational level at .01 level. Other factors which showed significantly negative relationship at .05 level were satisfaction and morale and overall organisational effectiveness. Insignificant and negative relationship was seen between communication, leadership and performance. Correlational analysis revealed that highly qualified managers with academic background had low degree of perception of adaptability, satisfaction, decentralisation, control and overall effectiveness.

In the non-academic group, none of the selected variables showed significant relationship. Unlike the managers with academic background, the non-academic group depicted positive relationship with the educational qualification in adaptability and flexibility, communication, control and total effectiveness dimensions. Negative relationship was observed in case of satisfaction and morale, leadership, decentralisation and accountability, and performance.

In the non-academic group, increase in educational level tended to fortify the perception of adaptability, communication, control and total effectiveness. With the increase in the educational level, satisfaction, leadership acceptability, decentralisation and performance tended to decrease.

5. In the academic group, all the selected dimensions, adaptability and flexibility, satisfaction and morale, communication, leadership, decentralisation and accountability, control, performance and total effectiveness, depicted insignificantly negative relationship with the age factor. The inference drawn from this was that with the increase in age of the managers with academic background, the score on each dimension declined.

In the non-academic group, correlation scores were different, but none of them showed significant relationship. In this group, adaptability and flexibility, satisfaction and morale, and communication showed positive relationship. The factors which were negatively related were, leadership, decentralisation and accountability, control, performance and total effectiveness.

This led us to the conclusion that with the increase in age, adaptability, satisfaction and communication perception increased in the non-academic group. Similarly, with the increase of age factor, decentralisation, performance, control, leadership and overall effectiveness decreased. But these relationships were not significant.

6. In the academic group, all the selected dimensions, i.e. adaptability and flexibility, satisfaction and morale, communication leadership, decentralisation and accountability, control, performance and total effectiveness, had insignificant and negative relationship with the experience factor. This led to the conclusion



that with the increase in experience of the managers with academic background, the degree of perception on these factors dropped.

The non-academic group of managers showed positive relationship with the communication factor. Adaptability and satisfaction, leadership, decentralisation, control, performance and total effectiveness, showed negative relationship. None of them was significant even at .05 level. It may be postulated here that with the increase in experience level of the managers with non-academic background, perception of selected variables and effectiveness tended to decrease. Communication increased with the increase in experience.

## CONCLUSIONS

The personal characteristics of the managers seemed to influence their perception towards organisational effectiveness. Difference in degree of perception of the managers in case of both highly qualified and low qualified, and academic and non-academic background was significant. On most of the factors, except for satisfaction and control, the low qualified group had significant degree of difference, they had greater mean values. In case of the non-academic group, adaptability and communication were perceived more in the organisation. Age difference did not account for the significant variations in perceptions of the managers. With increase in educational qualifications of the academic group, the scores on many dimensions declined significantly. The non-academic group showed positive relationship with few variables when correlated with education level. Progress in age regressed the scores on each dimension in the academic group. The non-academic group, compared to the age factor, had few positive relationships with the selected variables. Experience decreased effectiveness perception in case of managers with both academic and non-academic background.

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## **Learned Helplessness among Indian Women: An Empirical Study**

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**D**EPRESSION occurs among both sexes but there is a difference in the frequency of its occurrence among men and women (Levitt and Lubin, 1975; Nandi, Mukherjee, Banerjee, Chatterjee, Boral and Sarkar, 1982; Singh, Sachdev and Tiwari, 1980; Weisman and Klerman, 1979). Steele (1978) found that women report greater normal depression than men do.

Radloff and Monroe (1978) have explained depression among women with the learned helplessness model. It is suggested that women are frequently exposed to situations in which they experience, more than men, loss of control, failure and

punishment. This aversive type of situations not in their control is more frequent for women than for men. Such aversive uncontrollable situations result in depression (Radloff, 1975; Radloff and Monroe, 1978; Walker, 1978). Walker has suggested that sex-role socialization may be responsible for the learned helplessness behaviour of adult women, and found that women had greater exposure to non-contingency which leads to learned helplessness. Learned helplessness has been presented as a laboratory analog of depression. The present investigation was an attempt to study the effect of exposure to non-contingency on Indian College girls.

The learned helplessness model was formulated by Seligman (1975) and was later reformulated by Abramson, Seligman and Teasdale (1978). According to the earlier model by Seligman, exposure to non-contingent or uncontrollable aversive, as well as, positive events produces cognitive emotional and motivational deficits and these deficits have their parallel in depression. The later reformulation suggested that causal ascriptions for performance play an important role in the development of learned helplessness and depression.

Learned helplessness induced shows deficits in their performance on cognitive tasks (LeUnes, Nation and Turkey, 1980; Parsons, Adler and Meece, 1984; Miller and Seligman, 1979; Tennen, Drum, Gillen and Stanton, 1982). A similar kind of dysfunction of cognitive performance has been found among depressives (Buceta, Polaino-Lorente and Padron, 1983; Dwivedi and Shukla, 1982; Sharma et al., 1984). The cognitive, motivational and emotional dysfunction characteristic of learned helplessness has been found to occur among subjects exposed to non-contingent reinforcement (Miller and Seligman, 1975; Klein, Fencil-Morse and Seligman, 1976; Trice, 1982; Parsons, Ruble, Hodges and Small, 1961; Tiggegan, Barnett, and Winifield, 1983; Mikulincer, 1988).

Some of the studies have used only cognitive measures for assessment of learned helplessness occurring as a result of exposure to non-contingent reinforcement (Campbell, 1979; Buceta et al., 1983). Sometimes learned helplessness has been found to be generalized across situations (Hiroto and Seligman, 1975) whereas, on some occasions, it was situation specific (Cole and Coyne, 1977). In order to explain these varying types of results, the reformulated model was presented by Abramson et al. (1978).

According to the reformation, these inconsistent findings are because of the causal attributions of the subjects for the various outcomes/reinforcements. These attributions could vary along three dimensions: internal/external, stable/unstable and global/specific. The individuals exposed to an uncontrollable event make an attribution about the cause of this event, the attributions for causality affect their expectancy regarding the future contingency or the relationship between response and outcomes.

Non-contingent failure attributed to ability, which is internal, produces greater performance deficits, than attributed to effort, which is external (Dweck and Repucci, 1973; Diener and Dweck, 1978). Attributions of the performance to internal factors influence the involvement of the person with the work (Peterson and Seligman, 1984). Therefore, failure attributed to internal factors produces depression (Metalsky, Abramson, Semmel and Peterson, 1982; Mikulincer, 1986). On the other hand, coaching children to attribute their performance to lack of effort results in decrease in helplessness deficits (Dweck, 1975). Attribution of performance to difficulty of task (external, specific) removes helplessness effect (Douglas and Anisman, 1975; Mikulincer, 1988; Tennen and Eller, 1977. Sedek (1982) reports that in attributional manipulations, attributing performance to luck does not produce deficits in performance.

Mikulincer (1988) reports that following exposure to four unsolvable problems, internal attributers exhibited stronger feelings of incompetence and a decrease in performance compared with external attributers. Attributions to internal, stable and global attributions for negative events produced greater depression than attribution to external, stable and specific events (Brown and Siegal, 1988; Metalsky, Halberstadt and Abramson, 1987).

Peterson and Seligman (1983) suggested that among women learned helplessness is more because of their bringing up. Other studies have also suggested that feminine sex-role is prove to learned helplessness and depression (Hammers and Peters, 1978; Bristow, 1978; Baucom, 1980). Before any study on learned helplessness could be taken up on Indian women the suitability of the model for Indian sample had to be established. In order to establish the validity of the learned helplessness model among Indian women, the present investigation was taken up. The specific objectives of the study were:

1. To see the effect of non-contingent failure on the development of learned helplessness among college students.
2. To see the effect of attribution of failure to various factors like ability, luck, effort and difficulty and task on learned helplessness.

The hypotheses tested were as under:

1. Depressed group will show deficits in their performance on cognitive tasks.
2. Cognitive performance of non-contingent failure group will be poorer than contingent failure or control group.
3. Non-depressed and depressed will be significantly different from each other on attributional dimensions.
  - a. Depressed will be higher than non-depressed on attribution of their performance to ability.

- b. Non-depressed will be higher than depressed on attribution of their performance to luck, effort and difficulty of task.
- 4. Non-contingent failure group will be different from contingent failure group on attributional dimensions.
  - a. Non-contingent failure group will be higher than contingent failure group on attribution of their performance to ability.
  - b. Contingent failure group will be higher than non-contingent failure group on attribution of their performance to luck, effort and difficulty of task.

## METHOD

### *Sample*

The sample consisted of girl students from colleges of Delhi University, studying in first year, having scholastic achievement level of second division in their Class XII board examination, and belonging to families where per head expenditure, was around Rs. 450/- to Rs. 800/- calculated by dividing the total income of the family by the total number of members of the family.

Those subjects who were selected on the basis of the above criteria were tested on Beck's Depression Inventory (1969) and classified as depressed or non-depressed, depending on their score. Non-depressed were those who scored at or below 10 ( $Q_1$ ) and depressed those who scored at or above 21 ( $Q_3$ ).

### *Design*

A 2 (depression)  $\times$  3 (treatment) factorial design was used in this study. Two groups of depressed and non-depressed were assigned to the three treatment conditions: non-contingent failure, contingent failure and control.

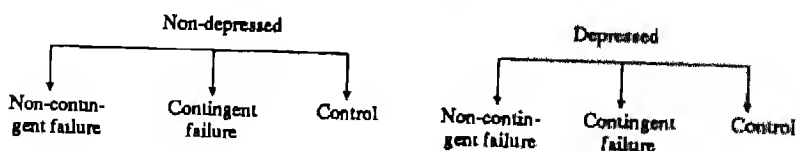
The treatment consisted in exposing the subjects to the training task which consisted in giving a series of ten cards to the subjects one by one. On each card there were two figures, out of which one figure was marked as the right figure. Each card was shown to a subject for a period of ten seconds. The subject was asked to test what concept was communicated to her through the cards. After the subject's responding, feedback was provided.

The non-contingent failure group was given failure feedback on eight out of ten trials, irrespective of their performance on the basis of a predetermined schedule of reinforcement which was FFFFFFFFFF. The contingent failure group was given feedback on the basis of their actual performance from trial to trial.

Twenty non-depressed and 20 depressed subjects were randomly exposed, ten each to the non-contingent failure and control groups. In order to have ten

depressed and ten non-depressed in the contingent failure group, in which only those subjects were included who actually failed on 80 per cent trials, 33 non-depressed and 26 depressed were exposed to the training task. In this manner there were ten depressed and ten non-depressed in each of the treatment groups.

Schematic representation of the design is given below:



All the groups, except the control group, were asked to make attributions for their performance to Ability, Luck, Effort and Difficulty of task on a seven-point rating scale. After making attributions, all the groups, including the control group, took test-task, which was of concept learning type of task adapted from Roth and Bootzin (1977). The time taken to complete the task and the errors made were recorded.

### Procedure

The selected subjects were given the training task individually. The same instructions were given to all the subjects in the treatment group. The subjects were given feedback on the basis of the predetermined schedule of reinforcement. After exposure to the training task, attribution ratings were made by the treatment groups, except the control group. All the subjects in the treatment groups were then told that they had completed one part of the experiment and they would receive instructions for the second part of the experiment. Instructions for the test-task were given to the subjects. After completion of the task, the subjects were debriefed so as to ensure that they did not carry over any effect of the helplessness treatment.

### RESULTS

The means and standard deviations of the different groups on time and error are presented in Table 1. The data on time and error score were analysed by  $2 \times 2$  way analysis of variance. The depressed and the non-depressed differed significantly on both the cognitive performance measures: time and error ( $F(1,54) = 10.21$ ,  $p < .01$ ;  $F(1,54) = 7.89$ ,  $p < .01$ ). The means of the depressed group were higher than that of the non-depressed group on both the measures of performance.



Therefore, the performance of the depressed group was poorer than that of the non-depressed group. Hence hypothesis 1 was accepted.

TABLE 1 Mean, Standard Deviation (SD) and Range of Non-depressed and Depressed Exposed to Treatments on Time and Error Score					
		Treatments			
		Non-contingent failure	Contingent failure	Control	
Non-depressed  Time taken in minutes	Mean	10.46	9.06	7.48	
	SD	2.13	1.66	1.93	
	Range	6.83-14.00	6.35-12.50	5.00-11.33	
	Errors	Mean	9.20	6.10	3.50
		SD	3.23	3.45	3.10
		Range	4-15	1-13	3-9
Depressed  Time taken in minutes	Mean	13.18	10.06	9.21	
	SD	3.58	1.39	1.83	
	Range	9.41-20.00	7.20-12.00	6.48-12.00	
	Errors	Mean	11.90	7.00	6.90
		SD	3.81	3.13	2.42
		Range	8-19	1-12	4-11

There were significant difference among the treatment groups on both the time score and the error score ( $F(2,54) = 12.78, p < .001$ ;  $F(2,54) = 14.96, p < .001$ ).

Comparison of the means of time and error scores, using Duncan's New Multiple Range test, revealed that the non-contingent failure group was significantly different from both the contingent failure and control groups on time (3.48,  $p < .05$ ; 2.26,  $p < .05$ ) and error scores (5.35,  $p < .05$ ; 4.00,  $p < .05$ ) while the latter two groups were not different from each other. The means of the non-contingent failure group were high on both the measures, time and error, which means the performance of the non-contingent failure group was poorer than that of the contingent failure or control group. Therefore, hypothesis 2 was accepted.

The means and standard deviations of the different groups on the four attributional dimensions, ability, luck, effort and difficulty of task, are presented in Table 2. The data were analysed by  $2 \times 2$  way analysis of variance.

The depressed and the non-depressed group were significantly different on the attribution of their performance to ability and effort ( $F = 4.34, p < .05$ ;  $F = 4.98, p < .05$ ) but there was no significant difference on the attribution of their performance to luck and difficulty of task. The mean of the depressed group was high on the attribution of their performance to ability while the mean of the

non-depressed group was high on effort (Table 2). Therefore, hypothesis 3a was accepted and 3b was partially accepted for effort; it was rejected for luck and difficulty of task.

		Ability	Luck	Effort	Difficulty of Task
Non-depressed	Mean	2.70	4.20	3.40	4.7
	SD	1.16	1.23	1.51	1.57
	Range	1-5	2-6	2-6	1-7
Depressed	Mean	3.50	4.60	2.60	4.00
	SD	0.07	0.84	1.17	1.55
	Range	2-4	4-6	1-5	2-6

Since there were no significant differences between the treatment groups on ability, luck, effort and difficulty of task, hypothesis 4 was rejected completely.

## DISCUSSION

The results of this study provide partial support to the learned helplessness model. Hypotheses 1 and 2 with respect to non-contingent failure producing deficits in cognitive performance, and the depressed showing poorer performance than the non-depressed were accepted. The reformulated model's predictions regarding the role of attributions in the development of learned helplessness were only partially supported. The depressed group was significantly different from the non-depressed group on two attributional dimensions: ability and efforts, but there was no difference between the non-contingent failure group and the contingent failure group on any of the attributional dimensions.

The results show that treatment was successful in inducing helplessness, substantiating the hypothesis derived from the learned helplessness model that controllable failure produces performance deficits (Seligman, 1975; Abramson et al., 1978). These findings are in line with the earlier findings which have found that uncontrollable reinforcement produces debilitated solving of anagrams (Tennen, et al., 1982; Lubow et al., 1982). The performance of the depressed was also debilitated like those exposed to the non-contingent failure treatment in terms of both time and error score; both the groups show deficits in their cognitive performance. These findings also support the learned helplessness model's predictions (Miller and Seligman, 1975; Kammer, 1983).

The attributions of the depressed and non-depressed groups were significantly different on two attributional dimensions, ability and effort. The depressed group

attributed their failure to effort. These results could be explained with the reformulated model of helplessness. The depressed tend to make self-depreciating attributions as they attribute their failure to internal and stable factors, while the non-depressed attribute their failure to external factors, such as effort (Frankel and Snyder, 1978; Kuhl, 1981). The results were not supported by the studies of Blaney (1978), Zemore and Johansen (1980). It could be due to reluctance on the part of the subjects to accept that they were not making efforts as suggested by Snyder et al. (1973).

The findings in respect of luck and difficulty of task are not as suggested by reformulation. One plausible reason why the non-depressed did not attribute their failure to luck may be that the task was not important enough for them to attribute it to luck. Regarding attributions to difficulty of task, there were differences but not statistically significant. However, these findings are similar to those of Kuiper, (1978) and Zemore and Johansen (1980).

Self-depreciating bias is said to be present among the depressed in attributing their failure to their own ability in contrast with the non-depressed, who attribute their failures to effort (Pyszcynski and Greenberg, 1986). The non-depressed attribute their failure to effort. This belief helps them on a future test-task because they will put in more effort to succeed, thereby enhancing their chances of success. This kind of attribution acts as an antidote for the development of depressive mood (Peterson and Seligman, 1983).

The treatment groups were not different on the attribution of their performance to any of the attributional dimensions: ability, luck, effort and difficulty of task. Most of the studies assessing the attribution of the subjects have shown similar results (Gong-Guy, 1980; Pasahow, 1980; Tennen et al., 1982; Rosenbaum and Jaffe, 1983). All these studies show that the causal attributions made by the subjects following pre-treatment do not predict subsequent performance. A few studies in which contradicting findings are reported may be due to the select subject group or because the attributional manipulation was done (Willis and Blaney, 1978; Alloy et al., 1984).

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## Psychological Differentiation in Indian Children: Role of Ecology, Quality of Schooling and Home Environment

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THE concept of psychological differentiation as initially proposed by Witkin and his associates (1962) referred to the complexity of a system's structure. According to them, "a less differentiated system is a relatively homogenous structural state, a more differentiated system is a relatively heterogeneous state" (p. 9). The field dependence-independence cognitive style, a characteristic way to conceptualize the environment, involves ability to discriminate figure separately from its background. It also involves ability to orient oneself in space in the face of disorienting stimuli. Thus field independence is viewed as an indicator of

differentiated mode of cognitive functioning while field dependence represented a global mode of functioning. Lloyd (1972) had considered psychological differentiation as a kind of intelligence. The studies done in the last two decades have shown that it affects cognitive attainment and social functioning in significant ways. It has been found to be related to the efficacy of reinforcement, teacher-student interaction, cue salience and use of mediators in learning (Witkin et al., 1977a, b). Witkin and Berry (1975) have contended that greater differentiation signifies both increased specialization of psychological functions and an understanding of how oneself differs from one's environment and along what relevant dimensions. As one becomes more cognitively differentiated, there becomes available certain internal frame of reference that may be used as guide to behaviour; a less differentiated person fosters reliance on external referents. In a recent review, Witkin and Goodenough (1981) contended that less psychologically differentiated persons tend to show greater use of external social cues while more differentiated people show greater autonomy. Similarly, less differentiated ones have interpersonal orientation while more differentiated persons envisage impersonal orientation. Psychological differentiation is important for organising effective teacher-student interaction and classroom learning. The researches by Laosa (1977) and Witkin and Goodenough (1977) have indicated that learning can be maximized if there is proper match between the type of schooling and the cognitive style of children.

Psychological differentiation as proposed by Witkin is relevant to diverse areas of human functioning. A number of measures have been developed to measure the level of field dependence including the individually administered Children's Embedded Figures Test (Witkin et al., 1971). Sinha (1978) has reported that since CEFT is an abstract test using Western symbols, Indian children have difficulty in responding to it. He, therefore, has developed a Story Pictorial EFT appropriate for Indian children. This measure has been used in the present study.

Field dependence is found to be related to a child's early global conception of body which is gradually articulated at different paces under diverse social and cultural conditions (Ramirez, Castenada and Herold, 1974). Berry (1976) has reported that acculturation, emphasis on conformity and role differentiation significantly predict psychological differentiation. Ghuman (1977) has shown that middle class children were significantly more field dependent than working class children. On the whole, these studies implicate that psychological differentiation is related to differences in culture, ecology and socialization. The gender differences showing greater field dependence in girls than boys are due to their differential socialization. Educational stimulation has been found to enhance field independence.

The results of Indian studies about cognitive styles are conflicting. Some studies (Sinha, 1978; Majeed and Ghosh, 1979) show that environmental disad-



vantage makes an individual less differentiated. Other studies (e.g. Ghosh and Massey, 1979; Misra 1990; Misra and Tripathi, 1980) do not support this pattern. It has been observed that disadvantaged children are analytic and impulsive while advantaged children are less analytic and more reflective (Das and Panda, 1977). It is, therefore, relevant to investigate developmental changes in psychological differentiation in children.

The present study analyzed the relationship of ecological background, characteristics of home environment and quality of schooling with psychological differentiation in primary school children. In particular, this study explored the developmental pattern of psychological differentiation in children hailing from varying ecological backgrounds and to examine its relationship with certain aspects of school outcomes. Although rapid and large scale industrialization and modernization have tended to reduce the differences in socio-economic background and have tried to bridge the gap between rural and urban settings, there is still a considerable amount of difference between the eco-cultural contexts of villages and cities. The various agencies of socialization influence the upbringing of children in these two settings in diverse ways (Vyas, 1982). For instance, the rural setting is less individualistic, demands greater conformity, involves less structured developmental involvement for the child than the urban environment where children get greater individual attention and grow under relatively more planned environmental circumstances. Also, the urban children are exposed to varied role-models and experience complex environments demanding finer discriminatory skills. These differences suggest that the children living in villages would be more field-dependent and would show a greater amount of gender differences. Finally, the magnitude of difference between rural and urban children would grow with advancing age. In regard to schooling, it was argued that the schools equipped with proper facilities of education and extra-curricular activities promote field-independence than the schools with inadequate facilities and lack of structure.

Another concern of the study was to see the pattern of gender differences in psychological differentiation and to identify home environmental variables which influence the development of psychological differentiation. The existing studies on the role of environmental variables in cognitive domain do not provide necessary information about the specific processes that are closely related to cognitive development. More recently, attention has been paid to the development of indices for assessment of specific components of deprivation and disadvantage (e.g. Misra and Tripathi, 1980; Rath and Samant, 1975; Tripathi and Misra, 1975). These measures represent considerable refinement over earlier approaches. However, they, too, are limited in many crucial respects. Most of them are developed with the assumption that physical facilities and experiences are absolute and treat the

overall score on the measure as an index of total environment based on self-report measures. They do not involve any serious effort towards conceptualization of environment and its components. The present study has adopted a differentiated concept of environment consisting of certain process variables which are proximally related to the development of the child. It was contended that this approach would enable understanding of the contributions of specific environmental variables towards the development of psychological differentiation.

### OBJECTIVES OF THE STUDY

The main objectives of the study may be summarized as follows:

1. To delineate the developmental changes in psychological differentiation in Indian boys and girls
2. To identify the influence of quality of education, and ecological background on psychological differentiation.
3. To examine the relationship of home environmental variables with psychological differentiation.
4. To investigate the relationship between psychological differentiation and school-related outcomes.

### HYPOTHESES

The following hypotheses were formulated:

1. Differentiation would increase with advancing age and boys would evince greater differentiation than girls.
2. Home environmental variables promoting autonomy and independence would be positively associated with differentiation.
3. Psychological differentiation would be positively related to school-related outcomes.
4. Children from urban areas and high quality schools would evince greater differentiation than their counterparts from villages and poor quality schools.

### METHOD

#### *Sample*

Three hundred school-going children (180 boys and 120 girls) from urban and rural ecological settings from eastern Uttar Pradesh participated in this study. They

were drawn from third, fourth and fifth grades of elementary schools of superior and inferior types. The mean age values of the children of the third, fourth and fifth grades were 87.75 months ( $SD = 2.33$ ), 98.37 months ( $SD = 4.67$ ) and 110.45 months ( $SD = 3.15$ ), respectively. The superior schools were equipped with play facilities and proper accommodation for reading and seating. They charged high fee and prescribed specific uniform for children. The inferior schools were sponsored by government or semi-government organizations and provided free education, had no prescribed dress and were ill-equipped with respect to educational facilities.

### *Measures*

*Story Pictorial Embedded Figures Test (EFT)*: This test developed by Sinha (1978) involves embedding the part-stimulus against the background of simple stories which children find interesting and which also provide the necessary preparatory set and the reason for finding out the part-figures from the complex pictures in which they are hidden. It has six sets of complex cards accompanied by six cards containing the sample stimuli. With each complex picture a story is coupled which poses the problem of locating the hidden object in the complex picture. The internal consistency of this measure has been estimated at .70, and test-retest reliability at .80. The maximum possible score on this test was 41.

*School Learning*: With a view to obtaining an account of a child's competence in school learning, a teacher's rating scale was developed by the present authors. It consists of 25 items dealing with effort in studies, understanding of subject matter, attendance, persistence, interest in problem-solving and linguistic capacity. Each item was rated on a 3-point rating scale.

*Home Environment*: This measure was developed by the authors (Misra and Tiwari, 1986) to assess objective and perceived environment with a focus on proximal environmental variables. It had 40 items dealing with seven sub-scales, i.e. (1) intellectual climate of home; (2) physical environment of home; (3) Child's perception of his environment; (4) parental concern; (5) verbal interaction; (6) Child's relation with school; and (7) parental pressure for achievement. For each item a 5-point rating scale has been developed. The inter-observer agreement for the different areas of this measure ranged from .84 to .93 and internal consistency ranged between .85 to .88. It has been found to be significantly positively related to a number of cognitive measures.

### *Procedure*

The study was conducted in two phases. In the first phase children were randomly drawn from identified schools of rural and urban areas and data on home

environment were collected from parents. The parents were extensively interviewed at their residences and observations of home environment were made. In the second phase, the measure of cognitive differentiation was administered on children in their schools. In addition the class teachers were requested to rate the children on the measure of school learning and competence.

## RESULTS

### *Psychological Differentiation in Boys and Girls*

The means and standard deviations of scores of the girls and boys on EFT are shown in Table 1. A close perusal of this table reveals that the boys have scored higher than the girls across all cells except inferior school city area, where the girls have scored higher than the boys. The developmental changes were in the predicted direction. Also, the ecological differences and schooling-related differences were in the hypothesized direction.

TABLE 1 Performance of Girls and Boys on Story Pictorial EFT							
Ecology and School Quality	Grade	Girls		Boys		Total Sample	
		M	SD	M	SD	M	SD
Rural superior school	Fifth	20.7	6.48	27.4	5.74	24.72	6.66
	Fourth	20.50	7.64	22.60	6.09	21.76	6.54
	Third	17.10	9.07	20.93	5.57	19.40	7.11
Rural ordinary school	Fifth	15.40	4.24	26.40	4.11	22.00	6.71
	Fourth	14.70	4.08	23.33	6.04	19.88	6.65
	Third	9.00	2.74	19.73	5.72	15.44	6.98
Urban superior school	Fifth	27.20	4.15	30.46	6.95	29.16	5.99
	Fourth	23.30	6.51	27.06	6.76	25.56	6.65
	Third	22.30	3.36	22.13	8.01	22.00	6.33
Urban ordinary school	Fifth	29.30	6.74	29.13	6.58	29.20	6.38
	Fourth	31.90	5.93	24.53	6.99	27.48	7.28
	Third	18.90	7.46	15.13	7.00	16.64	7.13
Note. There were 10, 15 and 25 children in each cell pertaining to girls, boys and total sample							

In order to examine the main and interaction effects of ecology, gender and quality of schooling for the boys and girls, separate  $2 \times 2 \times 3$  factorial between group ANOVAs were performed on the EFT scores. In the case of girls a significant main effect of ecological background was observed,  $F(1,108) = 71.16, p < .01$ . The girls from urban setting were more differentiated ( $M = 25.48$ ) than their rural counterparts ( $M = 16.37$ ). The main effect of grade was also significant,  $F(2,108) = 13.63, p < .01$ . The fifth graders scored highest ( $M = 23.15$ ), followed by the fourth ( $M = 22.60$ ) and third ( $M = 16.82$ ) graders. The 2-way interaction of ecological background and type of school reached significance level  $F(2,108) = 13.63, p < .01$ . It was found that the effect of ecological background was more pronounced in the case of inferior school girls. In the superior school, girls from rural and urban areas displayed a similar trend. The 2-way interaction of type of school and grade also reached the significance level,  $F(2,108) = 3.57, p < .05$ . The mean scores revealed that the interaction was mainly due to the higher level of performance of children of inferior schools at the fourth grade level. The main effect of type of school and other interactions failed to reach the significance level.

The ANOVA of scores earned by the boys yielded significant main effect of type of school with higher score for superior school children ( $M = 25.11$ ) than their inferior school counterparts ( $M = 23.04$ ),  $F(1,168) = 4.64, p < .05$ . The main effect of grade was also significant,  $F(2,168) = 28.87, p < .01$ . It was noted that the fifth graders had scored highest ( $M = 28.35$ ), followed by the fourth ( $M = 24.39$ ) and third graders ( $M = 19.48$ ). The main effect of ecological background and all the interactions were non-significant.

### *Environmental Correlates of Psychological Differentiation*

The product moment correlation coefficients presented in Table 3 indicate that intellectual stimulation in home was significantly positively related to psychological differentiation (PD) for the boys as well as the girls. The physical environment as well as the perceived affective environment of home were positively related to PD in the case of the total sample, rural sample and girls. The quality of interaction with parents was significantly positively related to PD for the boys and the total sample. The perceived school environment was significantly positively related to PD in all the groups, except the urban sample. On the other hand, parental pressure was significantly positively related to PD in the case of urban sample. Parental concern was not significantly related to PD in any group. The number of siblings was negatively related to PD in all the groups but the value of correlation was significant in the case of the boys and the total sample. Ordinal position was negatively related to PD, though all the correlations were non-significant. The sufficiency of income was positively related to PD in all the groups, except the

urban sample. The child's health was positively related to PD but in the case of the urban sample and the boys the correlations were statistically non-significant. The caste status was significantly negatively related to PD in the rural sample.

TABLE 2 Relationship of Home Environmental Variables with Psychological Differentiation			
Environmental Variables	Boys (N = 180)	Girls (N = 120)	Total Sample (N = 300)
Intellective stimulation	16*	25*	21**
Physical environment	13*	24*	21**
Perceived home environment	09	37	24**
Verbal interaction	25**	005	18**
Parental concern	02	06	03
Perception of school	21**	32**	27**
Parental pressure	-06	-07	01
Position in caste hierarchy	03	06	-06
Number of siblings	-14*	-11	-16**
Birth order	-06	-11	-10
Health of the child	13**	45**	29**
Sufficiency of income	14**	32**	26**

Note: Decimal points are omitted. \*\*  $p.01$  \*  $p.05$

### Results of Regression Analysis

With a view to understanding the role of combination of environmental variables, the data were subjected to step-wise multiple regression analysis. Table 3 presents the results of this analysis for the three grade levels. The variables that produced an increment of less than one per cent in explained variance are not listed.

It is evident that health rating of the child was the most powerful predictor for differentiation at the fourth and fifth grades while the child's perception of school was important for the third grade. Ordinal position of the child was important for the third and fourth grades. Position in caste hierarchy and number of siblings explained eight per cent of variance at the fifth grade level. Sufficiency of income and verbal interaction had also contributed some amount of variance at fourth and third grades, respectively.

### Psychological Differentiation and Learning in School

The product moment correlations of scores on EFT with teachers' ratings are shown in Table 4. It is evident that PD, is highly positively related to all the aspects of teachers' rating regarding school learning of children.

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TABLE 3  
Results of Multiple R: Prediction of Psychological Differentiation  
using Environmental Variables

Grade	Environmental Variables	Multiple	Per Cent Increase in Explained Variance	F
Fifth	Health-rating of the child	45	20	25.24
	Parental concern	49	4	15.71
	Position in caste hierarchy	54	5	13.87
	Number of siblings	57	3	11.48
	Sufficiency of income	57	1	9.52
Fourth	Health-rating of the child	31	10	11.15
	Ordinal position of the child	37	4	8.14
	Sufficiency of income	41	3	6.66
	Verbal interaction in home	42	1	5.26
	Number of siblings	43	1	4.47
Third	Child's perception of school	32	10	11.32
	Ordinal position of the child	38	4	8.25
	Verbal interaction in home	41	2	6.52
	Parental concern	42	1	5.20
	Parental pressure for achievement	42	1	4.16

Note: Decimal points are omitted

TABLE 4  
Relationship of Psychological Differentiation with School Learning

School Learning Measures	Girls (N = 120)	Boys (N = 180)	Total Sample (N = 300)
Classroom behaviour	77	57	67
Judged competence	69	34	51
Academic skills	58	40	50
Parental involvement	44	30	37

Note: Decimal points are omitted

## DISCUSSION

The results revealed that the influence of ecological setting on the development of psychological differentiation was significant for the girls characterized by greater differentiation among the girls from the urban settings than the girls from the village settings. On the other hand, the performance of the boys from the two settings was almost similar. This difference implicates that the rural and urban environments differ in the nature of experiential opportunity which they extend to boys and girls. The urban environment provides a greater amount of exposure to complex stimuli and demands greater differentiation on the part of children than rural environment. This difference becomes critical in the case of girls because girls in rural environment are reared in relatively more restricted environments. On the other hand, boys have greater mobility and freedom which partly compensate for the environmental deprivation experienced in rural settings.

The type of schooling had a significant influence on the EFT performance of the boys. The boys coming from superior schools were more differentiated than the boys from inferior schools. However, such differences was not evident in the girls. This seems to suggest that the type of school had differential relationship with the development of psychological differentiation in the boys and girls. However, it is important to note that the type of schooling as used in the present study was a global variable and the details of schooling were not taken into account. Therefore, generalization of this finding should be done with caution. One possible explanation seems to be the fact that the school environment of girls in general has certain special characteristics which were shared commonly by superior as well as inferior schools which generally favour field dependence.

The developmental changes noted in the present study were similar for the boys and girls characterized by increase in psychological differentiation with advancing age. The data also indicated that the factor of grade (or stage) interacted significantly with the type of school for the girls. It was found that a greater amount of differentiation in the girls of superior schools was present at third and fifth grades, and the scores of the fourth graders were in favour of the inferior school girls. In addition, there was a significant interaction of ecological setting and type of school. The data showed that the children from superior schools in rural and urban settings had yielded similar performance while inferior schools located in urban settings yielded greater differentiation than their rural counterparts. This suggests that the effect of type of schooling was partly dependent upon the ecological setting. Urban environment is relatively more variegated in terms of stimuli which facilitate cognitive development and, therefore, partly overcomes the limitations created by inferior schooling. On the other hand, impoverished rural environment



produces a retarding effect and adds to the existing limitations. This situation accentuates the differences in performance.

The analysis of relationship of home environment variables revealed that intellectual stimulation, physical environment, perception of school, health status of child, and sufficiency of income were significantly related to cognitive differentiation in boys as well as girls. Verbal interaction was positively related to it in boys while perceived home environment was positively related to it in girls. The number of siblings was negatively related to it in both the groups though its value was significant in the case of boys only.

The results of the multiple regression analysis indicated that the child's perception of school and his ordinal position were the most important predictors at the third grade level. At the fourth grade level, the health status of the child, his ordinal position and sufficiency of income emerged as important variables. At the fifth grade level, the health rating of the child, parental concern, position in caste hierarchy and number of siblings had contributed to the maximum amount of variance in psychological differentiation. These results indicate that environmental variables are differentially sensitive to psychological differentiation at different age levels.

The results had also indicated that psychological differentiation was positively related to various dimensions of school learning as rated by the teachers. It was found that the relationship was relatively stronger in the case of girls than boys. The relationship of classroom behaviour and judged competence with psychological differentiation was stronger than the relationship of academic skills and parental environment.

## CONCLUSIONS

On the whole, the present study demonstrated that environmental influences on psychological differentiation differ for girls and boys as well as for children of different grade/age levels. In addition, the results also establish a close association between psychological differentiation and efficiency of child in school learning as judged by the teachers. This has an important implication for arranging the teaching-learning process. The environmental variables critically related to psychological differentiation were structural (e.g. birth order of child, number of siblings, position in caste hierarchy, etc.), child's health condition and some process variables (e.g. verbal interaction, parental concern, and parental pressure for achievement). The results implicate that the pattern of development of psychological differentiation in boys and girls differed in important ways. However, the present study was cross-sectional in its approach and had utilized a single measure of differentiation. The future research in this area should utilize other measures of

psychological differentiation and more refined measures of school learning in a longitudinal perspective.

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## Teacher Morale as Determinant of Teacher Perception of Supervisory Behaviour

PARAS MAL MEHTA

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**I**N the past, many studies have been done to explore the leadership behaviour of supervisors in industrial and school settings. Leadership behaviour of instructional supervisors in schools has been studied through the perceptions of those teachers under supervision. Bail found that only about five per cent of teachers were getting the kind of supervision they desired. Bradfield reported that the teachers wanted the type of supervision which could give them a feeling of belonging and personal worth, and they needed aid and advice, cooperation, sympathy, good human relations, and a certain amount of freedom in their work. These studies did not, however, consider teachers' level of morale as it might influence their perception of supervisory behaviour. The purpose of this study was to explore the relationship between teachers' morale and their perceptions of supervisory behaviour.

## DEFINITION OF TERMS

**Supervisor:** In a school there might be a number of persons charged with the responsibility of supervising instruction. In this study the term 'supervisor' refers to the person who was the immediate supervisor of the sample teacher working with him to improve instruction.

**Supervisory Behaviour:** This term does not imply the actual administrative and supervisory behaviour of a supervisor, rather this represents his behaviour as perceived by the teacher whose instruction he is helping to improve.

**Teacher Morale:** 'Morale' is a vague term and has several definitions. In the present context, teacher morale refers to a teacher's sense of belonging and loyalty to the school and his satisfaction with the work environment.

**Initiating Structure:** The term 'Initiating Structure' refers to the supervisor's behaviour in delineating the relationship between himself and the members of the group, and in endeavouring to establish well-defined patterns of organisation, channels of communication, and ways of getting the job done.

**Consideration:** The term 'Consideration' refers to behaviour indicative of friendship, mutual trust, and warmth in the relationship between the supervisor and the members of the group.

## METHOD

### *Sample*

In the present study two elementary schools and two high schools in New York City were involved. From each school 25 teachers were randomly selected and provided with two questionnaires. The subjects were told they would remain anonymous to ensure their free expression. After follow-up for three days, 63 teachers returned the questionnaires. One questionnaire could not be used being incomplete. On the basis of the responses recorded on one of the questionnaires, 15 teachers who had the highest level of morale, and 15 teachers who had the lowest level of morale were finally selected for the investigation. The mean difference between the scores of low and high morale teachers was found to be significant at .01 level.

### *Procedure*

To measure the level of teacher morale, a questionnaire consisting of eight items was developed. Some of the items were taken from a test devised by Dreeben and Gross, while the others were devised with unanimous agreement of the eight investigators of this study. The questionnaire was left without caption with the

intention of not letting the teachers know and feel that they were recording their own morale. Moreover, they were asked to respond in a spontaneous manner and were not told the purpose of the study. In the questionnaire a five-point rating scale was used ranging from 1 (most liked) to 5 (most disliked).

To collect the data on the teachers' perceptions of supervisory behaviour, the Leadership Behaviour Description Questionnaire was used. The questionnaire consisted of two dimensions—Initiating Structure and Consideration. The responses were measured along a five-point scale—Always, Often, Occasionally, Seldom and Never, and were scored 1 through 5, respectively. Items 12, 18 and 20 were scored in reverse. Since each dimension consisted of 15 questions, an individual score on both dimensions could range from 30 to 150.

### *Limitations*

1. The sample of the study could not be taken as representative because the subjects were drawn from four schools.
2. All the schools under investigation were drawn from New York City. Therefore, rural schools remained unrepresented.
3. Male and female teachers' perceptions of supervisory behaviour were not studied separately and comparatively.
4. An unstandardized test instrument was used to assess the teacher morale.

### DATA ANALYSIS

The data were analyzed to determine the effect of morale on teachers' perception of supervisory behaviour.

TABLE I Significance of Difference Between High and Low Morale Teachers' Perception of Supervisory Behaviour					
Teacher Morale	Mean	SD	DM	t-value	Level of Significance
High morale teachers	115.65	17.10	31.65	4.75	.01
Low morale teachers	84.00	18.20			
DM indicates difference between means					

Table I indicates that the teachers with high and those with low morale differed significantly in their perceptions of supervisory behaviour ( $p < .01$ ). When the data were further analysed in Table 2, it was found that they also differed on the Initiating Structure and Consideration dimensions ( $p < .01$ ). It is noteworthy that within the groups of low and high morale, their supervisors were found putting

approximately equal emphasis on both the dimensions of their behaviour as no significant difference was observed between the scores.

TABLE 2 Significance of Difference Between High and Low Morale Teachers' Perceptions on Different Dimensions of Supervisory Behaviour						
Dimension	High Morale Teachers		Low Morale Teachers		t-value	Sig. Level
	Mean	SD	Mean	SD		
Initiating structure	57.00	9.65	40.35	11.40	4.32	.01
Consideration	59.35	10.40	40.65	8.85	5.31	.01

The next step in the study was to locate the specific items on the Leadership Behaviour Description Questionnaire where the high and low morale teachers differed significantly in their perceptions of supervisors' behaviour.

TABLE 3 Items on which High and Low Morale Teachers Differed Significantly				
No	Item	Dimension	$\chi^2$	Sig. Level
1.	He does little things to make it pleasant to be a member of the group	Consideration	10.3	.05
2.	He tries out his new ideas with the group	Initiating structure	10.5	.05
3.	He rules with an iron hand	Initiating structure	27.14	.01
4.	He speaks in a manner not to be questioned	Initiating structure	40.46	.01
5.	He keeps to himself	Consideration	12.00	.01
6.	He looks out for the personal welfare of individual group members	Consideration	26.31	.01
7.	He assigns group members to particular tasks	Initiating structure	52.45	.01
8.	He refuses to explain his actions	Consideration	88.16	.01
9.	He backs up the members in their actions	Consideration	15.78	.01
10.	He emphasizes the meeting of deadlines	Initiating structure	10.83	.05
11.	He encourages the use of uniform procedure	Initiating structure	22.80	.01
12.	He is willing to make changes	Consideration	55.33	.01
13.	He is friendly and approachable	Consideration	74.60	.01
14.	He asks that group members follow standard rules and regulations	Initiating structure	11.62	.05
15.	He makes group members feel at ease when talking with them	Consideration	69.00	.01
16.	He puts suggestions made by the group into operation	Consideration	27.83	.01
17.	He gets group approval in important matters before going ahead	Consideration	28.64	.01
18.	He sees to it that the work of group members is coordinated	Initiating structure	34.50	.01

The teachers in the high and low morale groups were found to differ significantly on 18 of the 30 items (60 per cent) in their perception of supervisory behaviour, thereby demonstrating that morale is as one of the determining factors in a teacher's image of his supervisor's behaviour.

Furthermore, an attempt was made to examine those behavioural characteristics of supervisors as perceived by the high morale teachers, which received the highest and lowest scores.

TABLE 4 Five Items Scored Highest by High Morale Teachers				
No.	Items	Dimension	Score	Response Category
1	He does little things to make it pleasant to be a member of the group	Consideration	69	Never
2.	He is friendly and approachable	Consideration	69	Never
3.	He is willing to make changes	Consideration	66	Never
4.	He lets group members know what is expected of them	Consideration	64	Never
5.	He is easy to understand	Consideration	63	Never

TABLE 5 Five Items Scored Lowest by High Morale Teachers				
No.	Items	Dimension	Score	Response Category
1.	He rules with an iron hand	Initiating structure	32	Often
2	He keeps to himself	Consideration	35	Often
3.	He speaks in a manner not to be questioned	Initiating structure	38	Often
4.	He acts without consulting the group	Consideration	48	Often
5	He does personal favours for group members	Consideration	46	Occasionally

Table 4 indicates that a majority of high morale teachers perceived that their supervisor does not foster pleasant group atmosphere, is not friendly and approachable, is unwilling to make changes, does not let the group members know what is expected of them, and is not easily understandable. Further, they reported that he often rules with an iron hand, speaks in an authoritarian manner not to be questioned, acts without consulting the group, and keeps to himself. But they indicated that occasionally he does personal favours for the group members. Of the ten items, eight were found to be related to the Consideration dimension.

Tables 6 and 7 present those items which received the highest and lowest scores according to the low morale teachers.



**TABLE 6**  
**Five Items Scored Highest by Low Morale Teachers**

No.	Items	Dimension	Scores	Response Category
1.	He rules with an iron hand	Initiating structure	56	Seldom
2.	He is willing to make changes	Consideration	51	Occasionally
3.	He does little things to make it pleasant to be a member of the group	Consideration	48	Occasionally
4.	He acts without consulting the group	Consideration	47	Occasionally
5.	He tries out his new ideas with the group	Initiating structure	47	Occasionally

**TABLE 7**  
**Five Items Scored Lowest by Low Morale Teachers**

No.	Items	Dimension	Scores	Response Category
1.	He asks that group members follow standard rules and regulations	Initiating structure	26	Always
2.	He emphasises the meeting of deadlines	Initiating structure	32	Often
3.	He encourages the use of uniform procedure	Initiating structure	32	Often
4.	He is friendly and approachable	Consideration	33	Often
5.	He schedules the work to be done	Initiating structure	35	Often

The low morale teachers reported that occasionally their supervisor was willing to make changes, did little things to make the group members happy, acted without consulting the group, and tried out his new ideas with the group. But the teachers agreed that he seldom ruled with an iron hand.

Further, the teachers reported that their supervisor always asked them to follow standard rules and regulations and often emphasized on meeting deadlines, encouraged the use of uniform procedures, and scheduled the work to be done.

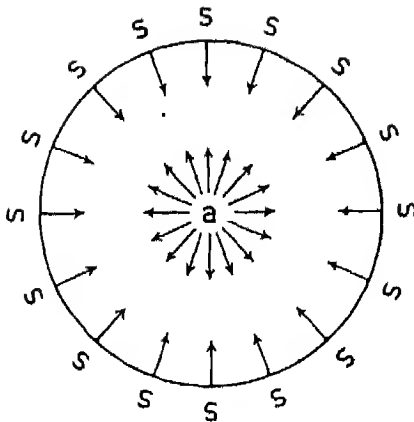
## FINDINGS

1. The sample groups of low morale and high morale teachers were found to differ significantly at .01 level on perceptions of their supervisory behaviour. Similarly, Blumberg and Weber, using another test instrument, had found that differences in perceived supervisory behaviour style were related to differential morale scores of teachers in a statistically significant manner.
2. When considering the dimensions of Initiating and Consideration, both the low morale and high morale teachers were again found to differ significantly at .01 level.

3. When individual items were taken into account, both the groups were found to differ significantly in their perceptions on 60 per cent of the behaviour characteristics of their supervisory behaviour.
4. On the basis of the test scores, the high and low morale teachers were found to differ along various dimensions.
  - (a) The high morale teachers reported that their supervisor was never friendly and approachable and often ruled with an iron hand. Contrary to this, the low morale teachers reported that he was often friendly and approachable, and seldom ruled with an iron hand.
  - (b) The high morale teachers reported that their supervisor never did things to make it pleasant to be a group member. The low morale teachers reported that he did so only occasionally.
  - (c) The high morale teachers revealed that their supervisor was never willing to make changes, while the low morale group reported that he was less adverse to change.
  - (d) The high morale teachers perceived that their supervisor often acted without consulting the group, but the low morale teachers indicated that he only occasionally did so.
  - (e) The high morale teachers further reported that their supervisor often kept to himself, spoke in a manner not to be questioned, was never understandable, and let the group members know what was expected of them.
  - (f) The low morale teachers reported that the supervisor tried out new ideas with the group, always asked the group members to follow standard rules and regulations, often emphasized on meeting deadlines, and scheduled the work to be done.

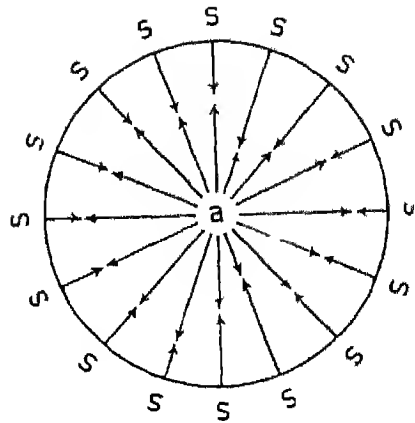
## DISCUSSION

The investigators were surprised to find that the low morale teachers held better perceptions of supervisory behaviour than the high morale teachers did. The data and computations were rechecked and still it was found that the low morale teachers perceived their supervisor as friendly and approachable and seldom ruling with an iron hand, while the high morale teachers reported just reverse. The findings can, however, be understood in terms of Mehta, Rosenberg, Phatak-Model of Administrative Behaviour (MRP-MAB). This model is based on the assumption that integration between the expectations of the administrative leader and the subordinates is essential for a healthy administrative climate. The model is illustrated as below.



**Fig. 1: Ideal Leadership Style**

a = Administrator or Leader  
s = Subordinates or Followers



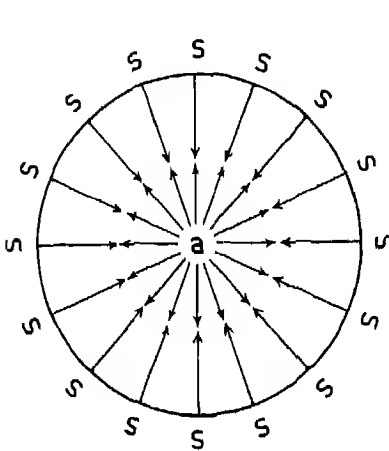
**Fig. 2: Worst Leadership Style**

a = Administrator or Leader  
s = Subordinates or Followers

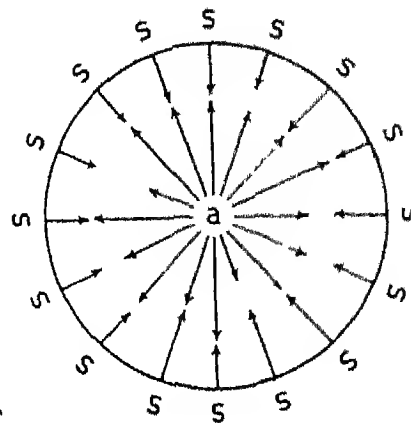
Figure 1 represents an ideal leadership style. The administrative leader and his followers (subordinates) have certain expectations of each other. They establish a rapport to achieve organizational goals. In such an administrative climate, conflict, militancy, and threat do not exist. Both the leader and his followers work in full cooperation, mutual respect, and understanding with each other. But such a leadership style hardly exists in any organization regardless of how successful the administrator is. It exists only when the leader and his followers are equally excited and motivated to achieve certain goals. But it is short-lived because it is human nature that we attempt to pull each other out of equilibrium.

Figure 2 represents a completely reverse leadership style in which the leader and the followers have a hard time getting along. Friendliness, closeness, trust and cooperation disappear, and difference, militancy, and cleavage permeate. These elements tend to grow and break down the operations of the organization. The administrative leader, the authority figure, and the followers united in group membership demand to relate to each other only in terms of meeting their own expectations. This gap between the expectations of the leader and his followers, which may be called a 'zone of militance', is dangerous for the leader and the organization, and sometimes for the subordinates too. The greater the zone of militance, the more the leader works under a climate of turmoil and threat. A wise

administrator prevents such a situation from developing. In the event the gap is so great that reconciliation becomes difficult between the leader and the followers, most often the leader is replaced; no doubt sometimes subordinates too are replaced. Therefore, this leadership style is also short-lived.



**Fig. 3: Easy-going Leadership Style**  
 a = Administrator or Leader  
 s = Subordinates or Followers



**Fig. 4: Humanistic Leadership Style**  
 a = Administrator or Leader  
 s = Subordinates or Followers

Figure 3 shows that the leader, to some extent, relates to his followers in terms of their expectations and a great majority of followers extend themselves to relate to him where he falls short ends. But there are always some subordinates in every organization who cannot relate well with the administration. This distance between the leader and such followers blocks the smooth communication between them. In such circumstances both the leader and such followers remain under reciprocal expressed or unexpressed criticism, mild threat, distrust and fear. But neither such subordinates nor the leader recognizes the need to necessarily relate with each other to perform their official duties. Both do not bother to relate to each other. They take it easy. If the number of followers failing to relate to the leader is large in an organisation, the leader cannot do his job as successfully as otherwise he could. This style of leadership is usually found in an ineffective leader who cannot take all his subordinates with him.

Figure 4 represents a leadership style which is based upon humanistic considerations. The leader knows well enough that there are always some subordinates who do their assigned duties well and with full sense of responsibility. Rather they themselves feel restless when they have not done their job well. They act well and relate well with the administration. They are high morale subordinates. Since the leader does not have tensions from them, he unconsciously happens to ignore their internal feelings and expectations.

Contrary to the high morale group, the low morale subordinates, because they have little sense of belonging to the organization and low job satisfaction, relate to the administration to a lesser degree. They generally either have a tendency to ignore their responsibilities, or unconsciously or consciously tend to cause problems and tensions for the administration. Probably, it would not be wrong to say that their personality make-up is such that they generally have adjustment problems, may be not with anyone else but with administration, regardless of where they go. This is their characteristic. But the leader cannot afford to look at them with strange eyes and provide the ground for widening the distance and difference with them. The leader has to get his work done. Having consideration of real facts, the leader, on humanistic ground, goes out to his way and reach to such subordinates more politely and friendly to narrow down the barriers of distance and communication with them. This helps to create a better organizational climate. It provides base for the leader for smooth working towards the accomplishment of organizational goals. This humanistic approach of supervisors under study through the perceptions of their subordinates, might have caused the low morale teachers to perceive and express the behaviour of their supervisors more favourable than the high morale teachers did. Dr. Guy Barbato rightly put it: "when an administrator discovers that some of his subordinates fail to relate to him, he goes out of his office and relate to them" to bridge the gap of indifference and distance with them.

## CONCLUSIONS AND SUGGESTIONS

The study establishes that teacher morale goes a long way in determining the teacher perception of supervisory behaviour and the low morale teachers hold more favourable perceptions of their supervisors' behaviour than the high morale teachers do. However, more studies are suggested to extend the validity of the findings. Studies, such as this, in individual schools may be of great help to a supervisor in improving his supervision of instruction. The 'MRP-MAB' opens some new avenues for further research. A research instrument may be developed to determine the leadership style of administrators in the context of this model, and

further, different leadership styles may be examined in terms of organizational productivity.

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## **Mathematics as a Function of Intelligence, Sex and Age: A Study of Attitudes of High School Students**

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**I**T is generally seen that less amount has been paid to the student's attitude by the classroom teachers or researchers in comparison to the considerable amount of attention given to cognitive achievement. Mathematics, specially, can be quoted as an example in which very few attempts at measuring attitudes towards its study have been made. Mathematics is generally regarded as a difficulty subject for study. It is not so popular even at college level, where less number of students offer it for their studies. Now models of teaching, innovations and new modern techniques of teaching Mathematics have not changed the situation. Yasui (1967) has reported in his study of an analysis of algebraic achievement and mathematical attitude between the modern and the traditional mathematics programmes in the

senior high school (a longitudinal study) that the measures of student attitude towards Mathematics provided by the "Mathematical Inventory" showed no significant difference between groups. Likewise, Alvi (1986) of Cincinnati University has shown in his study of effects of individualized instruction on achievement and attitude in general Mathematics in the ninth grade, that there was no significant difference between the attitude scores of the experimental group and the control group. Padma and Chakrabarty (1990) have indicated in their study that a significant difference exists between the attitudes of boys and girls towards Computer Education at 0.01 level. They believe that this might be due to the fact that girls are more conscious and aware about the technological progress of the country than boys. They have further concluded that no difference in attitude exists between tribal and non-tribal students towards Computer Education. Why is it so? What are the factors which determine attitude towards the study of a subject? Can these factors be modified in order to make the study of a subject popular?

Newcomb, Murphy and others (1937) have classified the related variables which are determiners of attitudes. Newcomb has dealt with the relationships between attitude and (1) individual characteristics, (2) experimental variables, (3) life experiences, and (4) other attitudes. Under the headings of individual characteristics are included sex, age, intelligence and some non-intellectual characteristics. Here it seems proper for the respective teachers and researchers to conduct such studies, in which most effective factors for modifying attitudes can be identified, and, accordingly, they can adjust suitable teaching approaches to create interest, and to enhance learning of a particular subject. The present study is an endeavour in this respect, as it tries to study the attitude towards Mathematics as a function of some individual characteristics like sex, age and intelligence.

#### OBJECTIVES AND HYPOTHESES

The present study had clearly defined objectives. Each objective was kept in mind while formulating the relevant pertinent hypotheses:

1. To study the attitude towards Mathematics as a function of intelligence. The hypotheses posed under this head were:

- (a) The students of a high intelligence group will have more positive attitude towards Mathematics, in comparison to the students of an average intelligence group.
- (b) The students of a high intelligence group will have more positive attitude towards Mathematics, in comparison to the students of a low intelligence group.



- (c) The students of an average intelligence group will have more positive attitude towards Mathematics, in comparison to the students of a low intelligence group.
2. To study the attitude towards Mathematics as a function of sex. The hypothesis posed for testing was: There is no significance difference between the attitude of male and female students towards Mathematics.
3. To study the attitude towards Mathematics as a function of age. The hypotheses posed for testing were:
  - (a) The students of 13+ have more positive attitudes towards Mathematics than the students of 14+.
  - (b) The students of 13+ have more positive attitudes towards Mathematics than the students of 15+.
  - (c) The students of 14+ have more positive attitudes towards Mathematics than the students of 15+.

#### SAMPLE AND POPULATION

The study was conducted in the academic session 1988-89 on a sample of 220 students (140 male and 80 female) studying Mathematics in Class IX of different higher secondary schools of the Education Department of Bhilai Steel Plant, Bhilai (M.P.). These schools are situated in different sectors of Bhilai Nagar and their students come from rural and urban, lower, middle and upper classes of the society. They consist of the children of labourers, peons, teachers, engineers officers, businessmen and farmers. In this way the students of higher secondary schools of Bhilai Nagar represent the population of a cosmopolitan society of any such township or city in Madhya Pradesh. The study covers three types of higher secondary schools of Bhilai Steel Plant, Bhilai selected on the basis of ratings of five experts. The schools were categorised into three group—good school, average school and poor school.

Various independent factors are expected to play some part in the determination of attitude towards Mathematics. They have been grouped into seven categories and are considered as associated factors.

#### ASSOCIATED FACTORS

1. *Intelligence Factor*: This factor was divided into three groups:
  - (a) *High Intelligence Group (HIG)*: The students scoring more than  $M + \sigma$  on Intelligence Test, i.e. above  $90.88 + 15.99 = 106.07$  were included in this group. The IQ range for this group is 107-138.

- (b) *Average Intelligence Group (AIG)*: The students scoring IQ marks in the range of  $M \pm \sigma$  were included in this group. The IQ range for this group is 76-106.
  - (c) *Low Intelligence Group (LIG)*: The students scoring less than  $M - \sigma$  IQ marks were included in this group. The IQ range for this group is 57-75.
- 2. *Sex Factor*: Male and female students were included in this group.
  - 3. *Age Factor*: It was divided into three groups:
    - (a) Age-group 13+ (Over 13 years but not completing 14 years)
    - (b) Age-group 14+ (Over 14 years but not completing 15 years)
    - (c) Age-group 15+ (Over 15 years).

#### TOOLS USED

The following tools were used:

- 1. A rating scale for classifying schools into three categories, viz. Good, Average and Poor. It was devised by the authors.
- 2. General Intelligence Test developed and standardized by Professor S.M. Mohsin of Patna University (Bihar) was administered to the students of two sections of Class IX in each category of schools.
- 3. To assess the attitudes of the students under study, the Scale for Measuring Attitude Towards Mathematics (Form B), developed and Standardized by Suydam (1974), was administered. The statement of the scale were translated into Hindi, and it was adapted and standardized under the guidance of Professor S.P. Ahluwalia to suit the requirements of the students of Hindi-speaking areas. This scale consists of 26 statements, out of which 13 statements are favourable and 13 unfavourable. For this scale, the maximum score will be 104. Therefore a subject scoring more than 52 marks is considered to have a 'favourable' attitude and a subject scoring less than 52 is considered to have an unfavourable attitude towards the study of Mathematics. Its split-half reliability coefficient was found to be .91 and test-retest reliability coefficient was found to be .62.

#### ANALYSIS AND INTERPRETATION OF DATA

The attitudes scale was administered to all the 220 subjects. The summated ratings were worked out individually for all the subjects. Tables 1, 2 and 3 give, in a summary form, the results of the analysis of data.

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**TABLE 1**  
Groups, Mean, Standard Deviation,  $SE_D$ ,  $df$  and  $t$  for Attitude Scores with respect to Intelligence

Intelligence Groups Compared	N	M	S	D	$SE_D$	$df$	$t$	Interpretation
HIG versus AIG	35 150	75.43 69.03	10.97 13.32	6.40	2.15	183	2.98	$p < .02^*$
HIG versus LIG	35 35	75.43 64.40	10.97 13.17	11.03	2.90	68	3.80	$p < .02^*$
AIG versus LIG	150 35	69.03 64.40	13.32 13.17	4.63	2.48	183	1.87	$p < .10^{**}$
KEY: HIG – High Intelligence Group AIG – Average Intelligence Group LIG – Low Intelligence Group								
					* Significant at .01 level (one-tailed test)			
					** Significant at .05 level (one-tailed test)			

**TABLE 2**  
Group, Mean, SD,  $SE_D$ ,  $df$  and  $t$  for Attitude Scores with respect to Sex

Sex Groups Compared	N	M	S	D	$SE_D$	$df$	$t$	Interpretation
Males versus Females	140 80	69.31 69.58	14.08 12.47	-.27	1.83	218	-.148	n.s.

**TABLE 3**  
Group, Mean, SD,  $SE_D$ ,  $df$  and  $t$  for attitude Scores with respect to Age

Age Groups Compared	N	M	S	D	$SE_D$	$df$	$t$	Interpretation
13+ versus 14+	69 84	73.01 69.32	13.53 12.86	3.69	2.15	151	1.72	$p < .10$
13+ versus 15+	69 67	73.01 69.96	13.53 14.43	6.05	2.40	134	2.52	$p < .02$
14+ versus 15+	84 67	69.32 66.96	12.86 14.43	2.36	2.25	149	1.05	n.s.

Table 1 shows the results of the analysis of the data to study the attitude towards Mathematics as a function of intelligence. The mean of the attitude scale scores of the high intelligence group is 75.43 and SD is 10.97. The mean of the attitude scale scores of the average intelligence group is 69.03 and SD is 13.32. To find out whether any difference exists in the attitude towards Mathematics, between the students of the high intelligence group and the average intelligence group a null hypothesis was framed, i.e. the students of the high intelligence group do not have more favourable attitudes towards Mathematics than the students of the average intelligence group.

In order to test the hypothesis of no difference, one-tailed 't' test was used. The value of 't' is found to be 2.98 which is greater than the tabulated value of 2.35 for 200 df (actual df 183) at .02 level (one-tailed test). Therefore, the hypothesis of no difference is rejected and it is concluded that the students of the high intelligence group show more favourable attitude towards Mathematics in comparison to the average intelligence group.

The mean attitude score of HIG is 75.43 and SD is 10.97, whereas the mean attitude score of LIG is 64.4 and SD is 13.17. In order to find out if there is any significance difference between these means, the following null hypothesis was set up: The students of the high intelligence group do not have more favourable attitude towards Mathematics than the students of the low intelligence group.

In order to verify this hypothesis, the one-tailed 't' test was used (Table 1). The 't' is found to be 3.80 which is far greater than 2.38 at .02 level (df 68). Therefore, the null hypothesis is rejected and it is concluded that the students of the high intelligence group have more favourable attitude towards Mathematics than the students of the low intelligence group.

The mean of the attitude scale scores of the average intelligence group is 69.03 and SD is 13.32, whereas the same scores for the low intelligence group are 64.40 and 13.17 respectively. In order to find out if there is any significant difference between these means, the following null hypothesis was set up: The students of the average intelligence group do not have more favourable attitude towards Mathematics than the students of the low intelligence group.

In order to verify this, the one-tailed 't' test was used (Table 1). The CR is found to be 1.87 which is more than 1.65 at .10 level (one-tailed test). Here, the null hypothesis is rejected at .10 level. It can be concluded that the students of the average intelligence have more favourable attitude towards Mathematics than those of the low intelligence group.

Table 2 gives the results of the analysis of the data, to study the attitude towards Mathematics as a function of sex. The mean of the attitude scale scores for males is 69.31 and SD is 14.08, whereas for females these were 69.58 and 12.47, respectively. In order to verify this, the following null hypothesis was set up: There is no significance difference between the attitudes of male and female students towards Mathematics. Here two-tailed 't' test is used (Table 2). The value of CR does not indicate rejection of the null hypothesis. Therefore, retaining the null hypothesis, it can be concluded that males and females do not differ significantly in their attitudes towards Mathematics.

Table 3 gives the results of the analysis of the data to study the attitude towards Mathematics as a function of age. The mean of the attitude scale scores for the students of 13+ is 73.01 and SD is 13.53. These scores for the students of 14+ are 69.32 and 12.86, respectively. In order to find out if there is any significant

difference between these means, the following null hypothesis was set up: The students of 13+ do not have more favourable attitude towards Mathematics than the students of 14+.

In order to verify this, the one-tailed 't' test was used (Table 3). The CR is found to be 1.72 which is greater than 1.66 at .10 level. Therefore, the null hypothesis is rejected and it is concluded that the students of 13+ age-group have more favourable attitude than the students of 14+.

. The mean of the attitude scale scores of 13+ students is 73.01 and SD is 13.53. These scores for 15+ students are 66.96 and 14.43, respectively. In order to find out if there is any significant difference between these means, the following null hypothesis was set up: The students of 13+ do not have more favourable attitude towards Mathematics, than the students of 15+ age-group.

In order to verify this, the one-tailed 't' test was used (Table 3). The CR is found to be 2.52 which is greater than 2.36 at .02 level (df 134). Therefore, the null hypothesis is rejected and it is concluded that the 13+ students have more favourable attitude towards Mathematics than the 15+ students.

The mean of the attitude scale scores of the 14+ students is 69.32 and SD is 12.86. Similar scores for the 15+ students are 66.96 and 14.43, respectively. In order to find out if there is any significant difference between these means, the following null hypothesis was set up: The students of the 14+ age-group do not have more favourable attitude towards Mathematics than the students of the 15+ age-group.

In order to verify this, the one-tailed 't' test was used (Table 3). The CR is found to be 1.05 which is less than 1.66 at .10 level. Therefore, the null hypothesis is retained and it is concluded that the students of the 14+ age-group do not have more favourable attitude towards Mathematics than the students of the 15+ age-group.

#### IMPORTANT FINDINGS

The analysis and interpretation of the data yielded the following conclusions:

1. The students of the high intelligence group have more favourable attitude towards Mathematics, in comparison to the students of both the average and low intelligence groups. This favourable attitude is more marked in the students of high intelligence than the students of low intelligence.
2. The students of average intelligence have more favourable attitudes towards Mathematics than the students of low intelligence.

On the whole, it can be concluded that attitude towards Mathematics is a function of intelligence.

3. As regards attitude towards Mathematics, males do not have more favourable attitude than females. That is, attitude towards Mathematics is independent of sex. This result contradicts the findings of Padma and Chakrabarty (1990). This is perhaps because their findings are mainly related with the measurement of attitude towards Computer Education and not towards Mathematics. The difference in findings may also be due to the difference in the social conditions of the subjects involved in the two studies. The referred study was performed in Shillong (Capital city of Meghalaya) and the present study was conducted in Bhilai Nagar (industrial town of Madhya Pradesh). On the other hand, the findings of the present study seem to agree with the findings of Sundararajan and Rajasekhar (1988) that urban girls do not have more favourable attitude towards the study of Physics, than urban boys. It is also observed that rural girls do not have more favourable attitude towards the study of Physics than rural boys.
4. The students of the age 13+ show more favourable attitude towards Mathematics in comparison to the students of the ages 14+ and 15+, but the students of 14+ do not have more favourable attitudes towards Mathematics in comparison to the students of 15+.

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## Ph.D. Theses Abstracts

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### *Divergent Thinking in Relation to Scholastic Achievement, Cognitive Style, Self-concept and Interest Pattern*

ASHOK KUMAR PANDEY

DIVERGENT thinking is a unique power of the human mind for leading human beings to high level of intellectual functioning. Torrance defines it as problem-solving ability. A person is called creative if he has divergent types of thinkings especially in the production of ideas, fluency, flexibility and originality. Creatively, the so-called divergent thinking in Guilford terminology includes fluency, flexibility, originality, elaboration and evaluative ability. Cognitive style is another aspect of cognitive process. Osofsky (1971) declared that cognitive style and creativity are less explored areas. Witkin and Dyke (1970) thought cognitive style as an important dimension of divergent thinking. Self-concept is one of the most dominating factors that influences an individual's behaviour. Sisk (1966), Weisberg and Springer (1961), Tan (1968) and several others worked on relationship of creativity and self-concept. Interest plays a significant and crucial role in the development of divergent thinking. Dellas and Gaier (1970) Holland (1962), Guilford (1957) explored this area. Achievement is a learned motive which serves as a source of strong motivation in creative achievement. Joseph (1966) Mayhan (1966), Feldusen and Traffinger (1971) showed that achievement plays a vital role in fostering creativity.

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Kalyani University (1989)



## MAIN OBJECTIVES

The main objectives of the study were:

1. To develop and standardise a test of scholastic achievement for Standard Ten in Bengali.
2. To administer the Torrance Test of Creative Thinking—Verbal and Figural (Form A and B), to measure creativity, Wilkin's Embedded Figure (Form A and B), to measure creativity, Wilkin's Embedded Figure Test (individual) to measure cognitive style, Basu's Self-concept Scale to measure self-concept, Chatterjee's Non-language Preference Record to obtain a measure of interest pattern, and Scholastic Achievement Test for measuring the scholastic achievement of the sample under consideration.
3. To perform analysis to show how field dependents differ from field independents on the measures of divergent thinking.
4. To determine whether the high self-concept group differs from the low self-concept group on the measures of divergent thinking.
5. To determine how high and low interest groups differ on the measures of divergent thinking.
6. To find how high achievers differ from low achievers on the measures of divergent thinking.
7. To find out the partial and multiple correlation between divergent thinking, self-concept, cognitive style, interest pattern and scholastic achievement.
8. To find out the possible determinant factors and to give them interpretation through factor analysis.

## HYPOTHESES

The study had the following hypotheses.

- O H1: There is a significant relationship between divergent thinking and cognitive style.
- O H2: There is a significant relationship between divergent thinking and self-concept.
- O H3: There is a significant relationship between divergent thinking and interest pattern.
- O H4: There is a significant relationship between divergent thinking and scholastic achievement.
- O H5: Cognitive style, self-concept, interest pattern and scholastic achievement combined together are a good predictor of divergent thinking.
- O H6: There is a significant difference between groups having high or low interests on the criterion of divergent thinking.

- O H7: There is a significant difference between field dependent and field independent cognitive style of learners on the criterion of divergent thinking.
- O H8: There is a significant difference between groups having high or low self-concept on the criterion of divergent thinking.
- O H9: There is a significant difference between high and low achievers on the criterion of divergent thinking.
- O H10: There is a significant difference between boys and girls on the criterion of divergent thinking.
- O H11: There is a significant difference between urban and rural learners on the criterion of divergent thinking.
- O H12: There are unique constellations of cognitive and affective correlates of divergent thinking existing in terms of common factors in different combinations.

#### SAMPLE

The sample consisted of 349 learners of Class X (both boys and girls) taken from Boys', Girls' and co-educational schools from the urban and rural areas of the districts of North 24-Parganas, South 24-Parganas and Nadia (West Bengal, India).

#### TESTS

The tests applied were:

1. Torrance Test of Creative Thinking—Verbal and Figural (Form A and B)
2. Witkin Embedded Figure Test (individual)
3. Basu's Self-concept Test (ABN)
4. Chatterjee's Non-language Preference Record (CNPR)
5. A test of scholastic achievement constructed and standardised by the researcher.

#### STATISTICAL ANALYSIS

1. Product moment correlations were computed to study the relationship of divergent thinking (and its dimensions), cognitive style, self-concept, interest pattern and scholastic achievement.
2. Step-wise multiple regression analysis was used to identify the best set of predictor variables for predicting divergent thinking.

3. Partial correlation was calculated for the prediction of divergent thinking.
4. t-test was carried out to find out the significance of differences.
5. Factor analysis was done to see the nature of factors.

## FINDINGS

1. The result indicates significant relationship between divergent thinking and cognitive style, self-concept, interest pattern and scholastic achievement.
2. The partial regression coefficient ranged from .02 to 3.65, partial correlation ranged from .01 to .82 indicating that divergent thinking is perfectly correlated to other predictor variables.
3. The multiple regression analysis shows divergent thinking as the most significant variable contributing to the prediction of cognitive style, self-concept, interest pattern and scholastic achievement.
4. Sex, achievement, self-concept, interest, locality and field dependence-independence account for significant difference in their effectiveness.
5. Factor analysis showed unique constellations of cognitive and effective correlates of divergent thinking.

## CONCLUSIONS

1. Significant correlation between cognitive style and different dimensions of divergent thinking shows that learners with more complex analytic cognitive structure shows greater ability of divergent thinking.
2. Significant correlation between self-concept and different dimensions of divergent thinking shows that an individual's perception of himself or herself affects his or her divergent thinking.
3. Significant correlation between interest pattern and different dimensions of divergent thinking shows that creative persons are distinguished more by interests, attitudes and drives than by intellectual abilities.
4. Significant correlation between scholastic achievement and different dimensions of divergent thinking shows that divergent production is due to high scholastic achievement.
5. Significant correlation between variables indicates high cognitive process.
6. Partial correlation R indicates that the predictor formula in the form of multiple regression solution is a better predictor of performance in divergent thinking.

7. Field-dependent were found better than field-independent in their divergent thinking.
8. Individuals with high self-concept were found better in all aspects of divergent thinking.
9. Individuals with high interest pattern had a significant contribution to his or her ability of divergent thinking.
10. Those who obtained high scores on the measures of creativity also achieved significantly better on the scholastic achievement test.
11. Male students were more creative than female students.
12. Rural learners performed better than urban learners with regard to divergent thinking.
13. The clusters of 19 variables precipitated into four distinct factors, viz. Perceptual Abilities and Divergent Thinking (Factor I), Divergent Thinking (Factor II), Self-concept and Verbal Divergent Thinking (Factor III) and Non-verbal Divergent Thinking (Factor IV). The emergence of a distinct factor of cognitive and perceptual domain (cognitive style) and personality domain (self-concept) with the dimensions of divergent thinking, highlights the nature of divergent thinking.

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*Educational Aspiration and Academic Achievement of Secondary School Students: Effect of Certain Family Factors*

K.S. RAJPUT

This study was conducted, keeping in view the following objectives:

1. To examine the influence of certain family factors on the educational aspiration and academic achievement of the students.
2. To find out the effect of family environment on the educational aspiration and academic achievement of the students.
3. To examine the effect of parental encouragement on the educational aspiration and academic achievement of the students.
4. To assess the effect of socio-economic status of the family on the educational aspiration and academic achievement of the students.
5. To compare different categories of students in terms of the effect of such family factors as family environment, parental encouragement and socio-economic status on the educational aspiration and academic achievement of the students.

HYPOTHESES

To study the effect of certain family factors on the educational aspiration and academic achievement of the students, the following tentative hypotheses were formulated:

1. There is no significant difference between the students of high and low parental encouragement, high and medium parental encouragement, low and medium parental encouragement regarding their educational aspiration and academic achievement.
2. There is statistically, no significant difference between the students of high and low family environment, high and medium family environment and low and medium family environment so far as their educational aspiration and academic achievement are concerned.
3. There is no significant difference between the students of high and low socio-economic status, high and medium socio-economic status and low

and medium socio-economic status with reference to their educational aspiration and academic achievement.

#### DELIMITATION OF THE STUDY

In order to concretize the problem, the present study was designed with the following controls:

1. Only those students were chosen who belonged to the Garhwal region.
2. The students were chosen from Classes XI to XII of Intermediate Colleges of Garhwal region.
3. The final study was carried out on the students of medium intelligence.

#### DESIGN OF THE STUDY

##### *Sample Space*

This study was conducted in the Garhwal region of Uttar Pradesh which covers five districts—Pauri, Tehri, Uttarkashi, Chamoli and Dehradun. There are 227 higher secondary schools in the Garhwal region and so it was very difficult to cover all the schools of all the five districts. Therefore, a list of schools of each districts was prepared in such a manner as to cover the schools location-wise and sex-wise.

Keeping in view the objectives of the study as well as the large size of the school population, the present researcher attempted to choose a representative sample of all the higher secondary schools by adopting the following criteria:

1. Every district of the region was represented.
2. Every type of school was represented.

Thus, four schools were chosen from every district in the following manner:

1. One school of boys and one school of girls from urban area.
2. One school of boys and one school of girls from rural area.

##### *Sample*

The sample consisted of the students of Classes XI to XII of higher secondary schools of the Garhwal region, covering male as well as female students belonging to urban and rural areas. Out of the 20 selected schools of the five districts of the Garhwal region, 50 students were selected from each school for the study by applying the stratified random sampling technique.

## VARIABLE TREATMENT

### *Independent Variables*

The independent variables taken into account were family environment, parental encouragement and socio-economic status measured through family environment scale, parental encouragement scale and socio-economic status scale.

### *Dependent Variable*

The dependent variables were academic achievement and educational aspiration measured through the marks of the students in their previous examinations and educational aspiration scale.

### *Controlled Variable*

The controlled variable was intelligence—measured through verbal intelligence test.

## DATA GATHERING DEVICES

The various tools used in this study given below:

1. Family Environment Scale (FES) developed by Sharma and Rajput (1988).
2. Socio-Economic Status Scale (SES) developed by Sharma and Rajput (1988).
3. Educational Aspiration Scale (BAS) developed by Sharma and Gupta (1980).
4. Parental Encouragement Scale (PES) developed by Sharma (1988).
5. Verbal Intelligence Test developed by Ojha and Chaudhary.
6. Examination Records available in the schools.

## ADMINISTRATION OF VARIOUS TOOLS

All the tools used in this study were administered in two phases. In the first phase, all the students selected from 20 schools were administered the verbal intelligence test with the purpose of identifying them on the basis of their intelligence. In the second phase, the remaining tools were administered to the medium intelligent students identified with the help of the verbal intelligence test.

### *Verbal Intelligence Test and Selection of Medium Intelligent Students*

In the first phase of data collection the researcher having the required copies of the verbal intelligence test went to all the 20 schools one by one to administer the verbal intelligent test. Keeping in view the purpose of the study, the students obtaining above 90 and below 60 scores were excluded and only medium intelligent students were taken for the final study. Out of 1000 students selected, 115 students were found highly intelligent, 285 medium intelligent and 600 low intelligent.

As stated above, only medium intelligent students were taken for the final study. These 285 students were administered the remaining tools of data collection in the second phase.

### *Administration of the Remaining Tools*

In the second phase of data collection, the researcher administered the remaining tools—Family Environment Scale, Parental Encouragement Scale, Socio-economic Status Scale and Educational Aspiration Scale—to the medium intelligent students selected out of 1000 student population. In this phase, too, the researcher adopted the same procedure in collecting the data as he followed in the first phase. This task was done after an interval of one month when the students of medium intelligence had been identified on the basis of the scores on VIT. The booklets of the above tools were scored and then the family environment, parental encouragement and socio-economic status of the students were made into three categories—high, medium and low—by adding SD to the Means and subtracting SD from the Means of the scores on FES, PES and SES and the students were placed in these three categories. The effect of the above familial factors on the academic achievement and educational aspiration of the students was studied and conclusions drawn.

### *Scheme of Statistical Treatment*

Since the present study was an exploratory one, simple descriptive statistical techniques were applied in analysing the data obtained on the various tools. An attempt was also made to find out the significant differences between the groups of students. Hence, in the treatment of the data, Mean, SD and t test were found most suitable. Therefore, these techniques were used in this study.

### CONCLUSIONS

The results of the study led to the following conclusions:



- ✓ 1. The educational aspiration of the students, in general, was influenced positively by their parental encouragement.
2. The urban students having high parental encouragement were significantly higher in their educational aspiration than the rural students in all the three groups of parental encouragement.
3. The educational aspiration of the students, in general, having high and medium family environment was significantly higher than low family environment.
4. The urban students belonging to medium family environment were influenced more than the low family environment group of rural students in their educational aspiration.
5. The SES of the total students had no effect on their educational aspiration.
6. The rural students having high, medium and low SES were highly influenced in their educational aspiration in comparison to the urban students of the same groups.
- ✓ 7. The academic achievement of the students was influenced in proportion to their parental encouragement.
8. There was significant effect of parental encouragement on the academic achievement of the urban students receiving a high amount of encouragement from their parents.
9. When compared location-wise, the urban students, in general, were highly influenced by their parental encouragement as regards academic achievement in all the groups.
10. ✓ The total students were influenced in their academic achievement by their family environment proportionately.
11. The urban students were influenced by their family environment in their academic achievement than the rural students in almost all the groups.
12. There was no effect of SES on the academic achievement of the total students in all the three groups.
13. There was more effect of the SES of the urban students on their academic achievement in comparison to the rural students in all the groups.



## *Predictors of Student-Teacher Performance in Secondary Teacher Training*

NIRMAL SABHARWAL

TEACHING has come to be recognised as a profession. It is often called the mother or creative source of all professions. Teaching is a specialized job and requires the services of competent teachers. Research signifies that the larger the number of characteristics possessed by an individual, the greater is the possibility of his/her becoming a successful teacher. Hence, only such candidates should be recruited to the teacher training course who have the potential to become competent teachers and obtain professional excellence. Therefore, the present study was conducted to predict student-teacher performance in the secondary teacher training course on the basis of selected context variables.

The study purported to achieve the following objectives:

1. To assess the status of different groups of student-teachers with regard to context variables.
2. To assess the performance of different groups of student-teachers in secondary teacher training course.
3. To study the relationship between student-teachers' scores on context variables and their performance in secondary teacher training course.
4. To predict student-teachers' performance in secondary teacher training course on the basis of their scores on context variables.

### HYPOTHESES

The following null hypotheses were formulated for empirical verification:

- HO<sub>1</sub> There is no significant difference in the mean scores of different groups of student-teachers with regard to context variables.
- HO<sub>2</sub> There is no significant difference in the mean achievement scores of different groups of student-teachers as measured by classified groups of papers in secondary teacher training course.
- HO<sub>3</sub> The student-teachers' scores on context variables do not have positive significant relationship with their achievement scores as mea-

sured by different groups of papers in secondary teacher training course.

- HO<sub>4</sub> The student-teachers' achievement scores as measured by different groups of papers in secondary teacher training course cannot be predicted from their scores on context variables against the alternative hypothesis that at least one of the context variables significantly explains the variations of dependent variable, that is, its regression co-efficient is significantly different from zero.

## METHODOLOGY

The study followed the survey method. Correlation between context variables and student-teachers' performance in the secondary teacher education course was studied. An attempt was made to identify significant predictors from amongst the selected context variables to predict student-teachers' performance.

### *Variables Studied*

Three cognitive variables, namely, previous academic accomplishments, general mental ability and knowledge of two school teaching subjects and two non-cognitive variables, namely, anxiety and attitude towards the teaching profession and its allied aspects were selected as context variables. Of these five variables, the first variable represented student-teacher formative experience while the latter four represented student-teacher properties. Student-teacher achievement scores in the professional course were termed as product variables and were studied with reference to the following groups of subjects:

1. External Assessment of Theory (EAT)
2. Internal Assessment of Theory (IAT)
3. Total Assessment of Theory (TAT)
4. External Assessment of Pedagogy Courses (EAPC)
5. Internal Assessment of Pedagogy Courses (IAPC)
6. Total Assessment of Pedagogy Courses (TAPC)
7. External Assessment of Teaching Theory (EATT)
8. Internal Assessment of Teaching Theory (IATT)
9. Total Assessment of Teaching Theory (TATT)
10. External Assessment of Practice Teaching (EAPC)
11. Internal Assessment of Practice Teaching (IAPC)
12. Total Assessment of Practice Teaching (TAPC)
13. Total External Assessment (TEA)

14. Total Internal Assessment (TIA)

15. Total Assessment (TA)

### *Sample*

A sample of two hundred student-teachers belonging to arts and science streams was selected from eight colleges of education located in urban area of four regions of the country. Two colleges of education each were located in Rajasthan, Madhya Pradesh, Orissa and Mysore and were affiliated to Rajasthan University, Bhopal University, Utkal University and Mysore University. The sample in this effect may be termed as judgemental or a purposive one, while the number of student-teachers was incidental. College of education was the unit of sample.

### *Tools Used*

The following tools were selected for the study:

1. Group Test of General Mental Ability (GMAT)
2. Scholastic Test (ST)
3. Teacher Attitude Inventory (TAI)
4. Anxiety Scale (AS)

The following two tools were developed:

1. Student Teacher Information Blank (STIB)
2. Training Performance Information Blank (TPIB)

### *Statistical Techniques Used*

The following statistical techniques were employed in the study for analysing the obtained data in order to arrive at valid conclusions:

1. Conversion of scores obtained by student-teachers in each of the classified groups of papers in the professional course into per cent scores.
2. Means and standard deviations of scores obtained on context variables and product variables by the composite groups of student-teachers.
3. Means and standard deviations of scores obtained on context variables and product variables by groups of student-teachers classified on the basis of sex, area of domicile, subject specialisation and level of education.
4. Application of 't' test to test the significance of the difference between the mean scores of different groups of student-teachers on context variables and product variables.
5. Pearson Product Moment Correlations to determine the relationship between different pairs of variables.

6. Fitting of step-wise multiple regression equations for different product variables to find out which of the context variables significantly counted for the variance.

## FINDINGS

The findings of the present study can be grouped into three broad categories, viz. student-teacher composite scores and group profiles, correlational results and prediction of student-teacher performance. These are given below:

### *Student-Teacher Composite Scores*

1. The mean scores obtained by the student-teachers on the cognitive variables—PAA, ST and GMAT—are 4.76, 20.01 and 40.27, out of a total score of 9, 50 and 100, respectively, while on the non-cognitive variables—AS and TAI—the score are 38.75 and 207.01, out of a total score of 100 and 360, respectively.
2. The mean achievement scores of the student-teachers on TAT, EAT and IAT are 53.91, 49.51 and 66.00 per cent respectively, and on TAPC, EAPC and IAPC are 53.39, 48.73 and 66.18 per cent respectively. Similarly, their mean achievement scores on TATT, EATT and IATT are 54.84, 51.05 and 65.41 per cent, respectively.
3. The mean achievement scores of the student-teachers on TAPT are 63.65 per cent while on EAPT and IAPT, these are 64.04 per cent each.
4. The mean achievement scores of the student-teachers on TA, TEA and TIA are 57.82, 52.72 and 65.73 per cent, respectively.

### *Student-Teacher Group Profiles*

1. The mean scores on PAA of the female student-teachers, urban student-teachers, science student-teachers and post-graduate student-teachers are significantly higher than those of the male student-teachers, rural student-teachers, arts student-teachers and graduate student-teachers.
2. The mean scores on ST of the male student-teachers, urban student-teachers, science student-teachers and post-graduate student-teacher are non-significantly higher than those of their respective rural counterparts.
3. The mean scores on GMAT of the male student-teachers, rural student-teachers, science student-teachers and post-graduate student-teachers are higher than the mean scores of their respective counterparts but the difference in the mean scores is significant in the case of student-teachers classified on the basis of area of specialization.

4. The mean scores on AS of female student-teachers, rural student-teachers, arts student-teachers and graduate student-teachers are higher than the mean scores of their respective counterparts but the difference is significant in the case of student-teachers classified on the basis of sex.
5. The mean scores on TAI of female student-teachers, urban student-teachers, science student-teachers and graduates are higher than the mean scores of their respective counterparts but the difference is significant in the case of student-teachers classified on the basis of subject specialization.  
Null hypothesis No. 1 with respect to different groups of student-teachers' performance on some context variables, is rejected.
6. The mean achievement scores on all the fifteen product variables, namely, TAT, IAT, TAPC, IAPC, TATT, IATT, TAPT, EAPT, IAPT, TA, TEA, IAT, EAT, EAPC and EATT are higher for the females than those for the males. The difference is significant on all the product variables, except the last three.
7. The mean performance on all the fifteen product variables is superior for the urban student-teachers to that for the rural student-teachers. The difference is significantly higher in the mean achievement scores on five variables, namely, TAT, EATT, TATT, IATT and TA for the urbanites.
8. The mean achievement scores on six product variables, viz. IAPC, IAT, TAPT, EAPT, IAPT and TIA, are higher for the arts student-teachers than those for the science student-teachers the difference being significant for IAPC only. The mean achievement scores on the remaining nine variables, that is, TAT, TATT, EAT, EATT, TEA, IAPC, EAPC, IATT and TA, are higher for the science student-teachers than those for their counterparts, the difference being significant for the first five variables.
9. The mean achievement scores on all the product variables, except TEA, are higher for the post-graduate student-teachers as compared to those for the graduate student-teachers, the difference being significant in the case of IAT, IATT, TAPT, IAPT and TIA only. The graduates have scored significantly higher mean achievement scores on TEA.  
Null hypothesis No. 2 with respect to different groups of student-teachers' performance on some product variables, is rejected.

### *Correlational Results*

1. The student-teachers' achievement scores as measured by TAPC, TATT, TAT, EAPC, EATT, EAT, IATT, IAPT, TEA and TA have positive and significant relationship with their scores on PAA. It means that the student-teachers having better PAA fare better on external assessment and total assessment of the foregoing groups of papers. The relationship between the mean achievement scores on IAPC, IAT, EAPT, TAPT and TIA and the mean scores

- on PAA is positive but not significant. It shows that higher scores on PAA are not associated with higher achievement on the foregoing five groups of papers.
2. The student-teachers' achievement scores on eight groups of papers, namely, TAPC, TATT, TAT, EAPC, EATT, EAT, EAPT and TEA have positive and significant relationship with their mean scores on ST. It means that higher scores on these eight groups are associated with higher scores on ST also. The relationship between the mean achievement scores on IAPC, IATT, IAT, IAPT, TAPT, TIA and TA and the mean scores on ST is positive but not significant which means that higher scores on ST are not significantly associated with higher scores on internal assessment of different groups of theory papers and total internal assessment, two types of assessment of practice teaching and TA.
  3. The student-teachers' achievement scores on TAPC, TATT, TA, EAPC, EATT, TAT, IATT, TEA and TA have positive and significant relationship with their mean scores on GMAT. It indicates that high performance on these nine groups of papers is significantly associated with high performance on GMAT. Their mean achievement scores on IAPC, IAT and TIA are not significantly related to the mean scores on GMAT. It shows that these three types of internal assessment are not significantly related to mean scores on GMAT. Strangely, all the three types of assessment of practice teaching too have weak association with mean scores on GMAT.
  4. IATT is significantly related to scores on PAA, and GMAT. Similarly, IAPT has significant relationship with PAA. Internal assessment of all other groups of papers has low relationship with all the three cognitive variables, namely, PAA, ST and GMAT. It is, therefore, inferred that internal assessment is subjective and unreliable so far as these cognitive variables are concerned. In teaching and internal examinations, these higher abilities/qualities are not emphasized. Curriculum transaction does not seem to generate higher level of thinking process or does not measure these abilities/qualities.
  5. The student-teachers' achievement scores on TAPC, TATT, TAT, EAPC, EATT, EAT, IAPC and TEA have negative relationship with the mean scores on AS; it being significant in the case of TAPC and EAPC and AS only. It means that high scores on AS result in lower performance in these eight types of assessment. The relationship between IATT, IAT, TIA, TA, TAPT, EAPT, IAPT and AS is positive; it being significant in the case of all the three assessment of practice teaching only. In other words, anxiety motivates them to perform better in practice teaching. Pre-practice teaching preparation prepares student-teachers for actual practice teaching. As a result of

supervised and guided practice teaching, they acquire and refine the art and fundamentals of teaching. Anxiety acts as a stimulant to their performance in practice teaching.

6. The student-teachers' achievement scores on TAPC, TATT, TAT, EAPC, EATT, EAT, IATT, TAPT, EAPT, IAPT, TEA, TIA and TA have positive relationship with the mean scores on TAI; it being significant between TATT, TAT, EATT, EAT, EAPT, TAPT, TEA and TA and TAI and non-significant between TAPC, EAPC, IATT, IAPT, and TIA and TAI. It shows that higher scores on TAI are associated with higher performance on assessment of these groups of papers. Weak or non-significant relationship hints at the need to develop student-teachers' attitude towards the teaching profession and its allied aspects. Negative but non-significant relationship is found between IAPC and IAT and TAI.

Null hypothesis No. 3 with respect to student-teachers' mean performance in certain groups of papers and context variables, is not rejected while in the case of others, it is rejected.

### *Prediction of Student-Teacher Performance*

1. GMAT and PAA have emerged as significant predictors (the first and the second in order of priority) of the student-teachers' performance in TAT, EAT, TATT and EATT; and 1959, 22.72, 16.21 and 16.39 per cent variance, respectively, is explained by these two predictors jointly in the response variables. PAA has turned out to be the first and GMAT as the second predictor of student-teachers' performance in TAPC and EAPC, and 16.52 and 20.61 per cent variance, respectively, is explained by these two predictors jointly in the response variables. Besides this, GMAT alone is also a significant predictor of IATT and explains 2.19 per cent variance in the product variable. None of the context variables has emerged as a significant predictor of IAT and IAPC.
2. The context variables explain a total of 19.93, 17.75 and 16.45 per cent variance in the product variables TAT, TAPC and TATT, respectively, and a total of 23.43, 22.40 and 16.52 per cent variance in the product variables EAT, EAPC and EATT, respectively. In addition to these, the context variables explain a total of 4.08 per cent variance in the product variable IATT. Thus, it is clear that only cognitive variables have been retained as the predictors of performance of different groups of papers.
3. TAI has emerged as the first and ST as the second predictor of performance of student-teachers in TAPT and EAPT. AS has turned out to be the third predictor of performance in TAPT. These predictors jointly explain 9.29 and 24.11 per cent variance in the product variables TAPT and EAPT, respec-



tively. AS and PAA have turned out to be significant predictors of IAPT and the two predictors jointly explain 5.13 per cent variance in the product variable. A total of 10.16, 25.08 and 6.82 per cent variance is explained by the different context variables in the product variables of TAPT, EAPT and IAPT, respectively. It shows that both cognitive and non-cognitive variables predict student-teachers' performance in the secondary teacher education course.

4. GMAT and PAA have turned out to be significant predictors of TA and TEA and together these predictors explain 10.20 and 25.19 per cent variance in the two product variables, that is, TA and TEA, out of a total of 11.78 and 25.87 per cent variance which is explained by the context variables. None of the selected cognitive variables and non-cognitive variables has emerged as a significant predictor of student-teachers' performance on TIA.
5. GMAT is found to be the best predictor of student-teachers' performance on TAT, EAT, TATT, EATT, IATT, TA and TEA; and second best predictor of performance on TAPC and EAPC. PAA is the best predictor of performance on TAPC and EAPC and the second best predictor of performance in TAT, EAT, TATT, EATT, TA, TEA and IAPT. Similarly, ST comes to be the second best predictor of performance in TAPT and EAPT.
6. TAI emerges to be the best predictor of performance on TAPT and EAPT; while AS turns out to be the best predictor of performance on IAPT and the third best predictor of performance on TAPT.
7. None of the non-cognitive variables has emerged as a significant predictor of performance in different groups of theory, that is, TAT, EAT, IAT, TATT, EATT, IATT, TAPC, EAPC, IAPC, TEA and TA of the professional course.
8. None of the context variables has emerged as a significant predictor of performance on IAT, IAPC and TIA.

Thus, null hypothesis No. 4 is not rejected in the case of prediction of student-teachers' performance in certain groups of papers (IAT, IAPC and TIA) on the basis of context variables while in the case of others it is rejected.

## IMPLICATIONS

The study has implications for educational planners, administrators and teacher-educators involved in planning and executing pre-service teacher education programme. For screening and selection of candidates for admission to teacher education institutions, PAA, ST, GMAT, TAI and AS may comprise a battery of tests. The study suggests different combinations of context variables, in order

of importance, which can form useful sets of predictors of performance in various groups of papers offered and systems of evaluation used in the teacher preparation course. The knowledge of such predictors can be utilized in planning the course, teaching methods, techniques of evaluation and providing pedagogical knowledge and skills. Instead of using a single uniform selection procedure for all candidates, the one that distinguishes between groups of candidates on the basis of sex, area of domicile, subject specialization and level of education may be used. Prediction of performance may be done separately for theory papers and practice teaching since the two groups of subjects are found to require different variables/qualities for their success. Early administration of the battery of tests can help to identify student-teachers in need of guidance services; and to work out suitable strategies to help them become effective teachers.

Student-teachers can get feedback regarding their status on different context variables such as AS, TAI, ST, etc. and those in need of guidance from teacher-educators and counsellors can do so for shaping their cognitive and affective behaviour and attaining mastery of the subject content. The matching model theory can help them to plan and improve their academic work.



### *Education and Economic Growth in Ramanathapuram District*

(DR) R. SRINIVASAN

THE educational system of any country or a particular region which is a part and parcel of the global economic system constitutes a component as well as a promoter of economic growth. Education nowadays is regarded as an investment on individuals. Although human capital can be acquired in a few ways, for the majority of individuals education acquired in schools and colleges provides a solid foundation.

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Madurai Kamaraj University (1989)

Educational advancement and economic growth together represent a two-way process both enriching and contributing to the growth of the other. Also most people now agree that education is one of the reliable instruments for development.

The present study was designed to identify the nature and degree of relationship between the two phenomena of educational growth and economic growth. The study analysed the achievements and trend of growth in respect of education and economic performance of Ramanathapuram district. The Ramanathapuram district of Tamil Nadu is located in the southern part of Indian peninsula. It was formed in the year 1910 and covered an extent of 12,578 sq.km., representing 10.34 per cent of the geographical area of the state. Ramanathapuram is one of the less developed or backward districts of Tamil Nadu and its gross domestic product is lesser than that of the state average. Also the district lacks basic infrastructural facilities and is getting assistance under the DPAP (Drought Prone Area Programme).

#### OBJECTIVES OF THE STUDY

The main objectives of the study were:

1. To analyse the growth rate of educational activities.
2. To estimate the growth rate of the performance of economic activities.
3. To examine the nature and degree of relationship between educational growth and economic growth.
4. To describe the relationship between literacy rate and per capita income.

#### METHODOLOGY

The study was a descriptive-cum-correlational one. Time series data of thirteen years covering the period 1971-72 to 1983-84 were analysed. All the necessary data were collected from various institutions and offices and from published as well as unpublished sources.

The two parameters related were educational growth and economic growth. The phenomenon of educational growth was measured in terms of the trend of growth of (i) number of institutions, (ii) enrolment of students, (iii) efficiency (pass ratio) of students, and (iv) number of teachers employed. The economic performance of the district was measured through the growth trend achieved in both money and real income per head over the years. The growth trend of all the above were computed applying the semi-logarithmic growth model. For obtaining

the nature and degree of relationship between educational and economic growth, Spearman's rank correlation ( $\rho$ ) procedure was adopted.

### HYPOTHESES

The major hypotheses formulated in this study were:

1. The compound growth rate (CGR) of the educational institutions, i.e., schools, is significant.
2. The CGR of enrolment of boys, girls and the students taken together in the different levels of education is significant.
3. The CGR of efficiency of boys, girls and the students taken together in the different levels of education is significant.
4. The CGR of teachers employed in educational institutions is significant.
5. The CGR of per capita income at current and constant prices is significant.
6. There is a significant positive relationship between enrolment and per capita income.
7. There is a significant positive relationship between efficiency and per capita income.

The analyses carried out related to boys, girls and the students taken together, separately, for the various levels of education. Both null and alternative hypotheses were framed and inferences drawn on the basis of the rejection/acceptance of the null hypotheses.

### LIMITATIONS

The methodological procedure employed and the data analyses done were subjected to the following limitations:

1. The enrolment and efficiency of the students in formal educational institutions alone were analysed.
2. The efficiency of the students in college courses covered only those who were successful in their final year university examination.
3. Only the internal efficiency of the institutions was analysed.

### LINKAGE BETWEEN EDUCATIONAL AND ECONOMIC GROWTH

The analyses revealed that in the composite Ramanathapuram district a positive yet insignificant relationship existed between the trend of growth of total enrolment and money per capita income (0.46). Similarly, the value of correlation coefficient between total efficiency and money per capita income was also posi-

tive and not significant (0.39). But the relationship of total enrolment/efficiency and real per capita income showed a negative association ( $-0.42$  and  $-0.03$ , respectively).

The positive compound growth rates of total enrolment/efficiency as well as money and real per capita incomes and their positive association with the per capita income at current prices only exhibit the mutual benefit or influence each of them had on the other in the course of their progress.

The study in effect highlights the imbalance in the relative growth rates of enrolment/efficiency and per capita income. This is due to the fact that growth in real income had not established a significant trend as the economic backwardness of the district continued over the relevant period.

## FINDINGS

The major findings of the study are given below:

1. On the whole there was expansion in the total number of schools over the years. But the number of middle and high schools showed a declining trend. The increase in the number of higher secondary schools alone was significant.  
As far as college education is concerned, there had been no increase in the number of colleges after 1973-74.
2. Though the total number of students enrolled in colleges was on the increasing trend, yet only women's enrolment was positive and significant.
3. More number of students were there in schools and colleges in the district year after year. The growth rate of the overall enrolment for all the levels of education was found to be significant.
4. The growth rate of efficiency showed a declining trend only at the secondary school level.
5. The outturn of graduates in all courses of college education showed a significant growth rate.
6. The growth rate of overall efficiency of all levels of education was found to be significant.
7. The growth rate of employment of the teachers in schools and colleges was significant.
8. On the whole, the growth rate of employment of women teachers was the highest.
9. The per capita income at current prices showed a significant growth rate over the years.
10. The real per capita income, though showed a positive trend, was found to be not significant.

11. The relationship between overall enrolment in all levels of education taken together and money per capita income was positive (0.12) but not significant for the Tamil Nadu state over the relevant period.
12. The relationship between overall enrolment in all levels of education taken together and real per capita income was negative (-0.38) for the Tamil Nadu state as a whole.
13. All the obtained values of correlation between enrolment and per capita income were not significant for Ramanathapuram district and Tamil Nadu state. The inference drawn was that in real terms there was no direct relationship between them both for the district and the state as a whole.
14. Both for Tamil Nadu state and Ramanathapuram district the rate of literacy and per capita income over the ten year period, 1971-81, registered a quantitative increase. This showed a movement in the upward direction among them.
15. In Ramanathapuram district there was an excess of outmigration than immigration throughout the 1970s. So the district was relatively in a disadvantageous position.
16. Inspite of the positive and significant progress in terms of both enrolment and efficiency in the district, their relation with real per capita income turned out to be negative as real income had not grown appreciably.
17. The slightly better positive correlation obtained between enrolment and money per capita income in the case of Ramanathapuram district than that of Tamil Nadu state indicated the relatively advantageous influence they had on each other over the years as far as this district is concerned.

## CONCLUSIONS

The conclusions that follow the findings are detailed below:

1. The COR of internal efficiency of the institutions recorded the highest growth among all the indicators selected in this study.
2. The study brought out imbalances in the average annual relative growth rates of enrolment (2.7%), efficiency (2.96%), and per capita income (2.61% and 0.18%) at current and constant prices, respectively. The negative relationship arrived at between real per capita income and enrolment as well as with that of efficiency brings out the fact that the increase in the real income per head is not sufficient to obtain a positive correlation.
3. As all the positive correlation coefficients obtained in the case of enrolment/efficiency and money per capita income were not significant, the hypotheses that postulated a significant positive correlation could not be maintained.

4. The increase in the total number of schools as well as colleges did not turn out to be favourable and significant for the growth achieved in the district.
5. As the CGR of real per capita income was not significant, the hypothesis which tested the growth rate of per capita income could only be partly accepted for the growth recorded in current prices, and had to be rejected as far as the increase in real income per head is concerned.
6. The district requires concentrated attention for providing all the necessary infrastructural facilities. Also the density of population in the district is much below the state average. Lot more needs to be done to improve the economic prospects of the district.
7. In the field of education also the district has to be provided with facilities for all types of higher professional institutions suited to the needs of the locality. The facilities available at present are very meagre.
8. The rate of literacy and per capita income for the census year 1981 recorded an upward movement, as composed to the census year 1971, both for the Ramanathapuram district and Tamil Nadu state.
9. The higher or better positive relationship arrived at between total enrolment and per capita income at current prices for the district, as compared to state economy, reveals the better impact they had on each other in the course of their growth.

## SUGGESTIONS

On the basis of the findings, the following suggestions are made:

1. The district should be considered as the basic unit for all types of planning and execution of developmental work.
2. All the assistance now available as aid under DPAP and concessions offered due to its backwardness for starting industrial enterprises should be continued till an appreciable level of performance is attained.
3. Taking advantage of the coastal belt of this district more marine-based industries should be set up to accelerate the speed of progress.



*Reasoning Abilities at the Age of 14+: A Factorial Study*

KANTA PRASAD GARG

**I**N a democratic set-up each person has unique importance and dignity both as an individual and as a member of social group, and has to contribute meaningfully in the task of nation-building according to the best of his merits. Therefore, various commissions and committees have not only emphasized the development of the individual but also the need for this development to further the social goals of democracy, secularism and socialism, and have attempted to suggest well-designed educational programmes and ways to implement them. However, various learning tasks of an educational programme have proved to be not equally achievable by all the pupils due to difference in their mental ability and the stage of development. So, any kind of curriculum planning and innovation that is to be adopted, has to be done keeping in view the mental ability and the stage of development of the pupils. This entails a need to study the nature of individual differences in mental ability of the pupils at different stages of their development.

Various theories regarding the nature of mental abilities have been proposed—some favouring 'g' and 's' factors, some favouring 'g' plus group factors and 's' factors, and some favouring multiple independent factors. The observed differences in these theories were attributed by some investigators to differences in the homogeneity and heterogeneity of the subjects of investigations. Some other investigators attributed these differences to differentiation and/or maturation of an ability with increase in age. So, for any kind of curriculum planning or innovation in education, there was a need to study the individual differences in various mental abilities when these are clearly differentiated and/or sufficiently matured separately for two groups of pupils—one heterogeneous and another homogeneous.

On the basis of available evidence, one of the significant abilities for scholastic achievement, especially in the area of Science and Mathematics, which has been much emphasized in the new Curriculum Framework (1988), happens to be 'reasoning'. Reasoning has also been a part of the intelligence tests from the inception of the testing movement, and in almost all the major psychometric theories of intelligence, it has been considered a major component. The present investigator, therefore, decided to carry out an investigation into the pattern of



reasoning abilities at the age of 14+ when, according to the available empirical evidences, it is sufficiently differentiated and/or matured.

Apart from the *a priori* postulations about the concept of 'reasoning', some significant theoretical postulations based on empirical referents have been made about its nature by the innovative use of factor analytic procedures. After Thurstone (1938), abilities like Induction, Deduction and General Reasoning were investigated, which led some investigators to posit other abilities under reasoning. The studies conducted under the domain of reasoning led Guilford (1972) to posit it in terms of two mental operations—cognition and convergent production, four types of content of information—figural, symbolic, semantic and behavioural and six forms of products of information—units, classes, relations, systems, transformations and implications.

A number of investigators have been concerned about the pattern of relationship between reasoning abilities and achievement in Science and Mathematics (cf. Chapter II). On the one hand, variations in the pattern of reasoning abilities in these investigations led to the identification of sampling criteria for selection of pupils for future investigations. On the other hand, restriction of these studies to only three cognition and convergent production products led to the identification of the need to cover all the six product categories of information. Accordingly, the present investigation was planned to be conducted upon two groups of students—one based on the commonly used criteria of same sex, age and grade (heterogeneous sample) and another based not only on the criteria of same sex, age, grade, but also on the common context and equivalence in mental maturation (homogeneous sample), covering all the six cognition and convergent production product categories of semantic information (cf. Chapter III).

## OBJECTIVES

The objectives of the study were:

1. To identify the criteria for grouping of students into a homogeneous and a heterogeneous sample.
2. To identify the factors that will explain common variance in reasoning ability tests in the homogeneous and heterogeneous samples.
3. To study the variations in factor patterns of reasoning abilities in the two samples.

## HYPOTHESES

The following hypotheses were formulated.

1. Differentiation of reasoning abilities takes place amongst the pupils of 14+ age-groups.
2. It is possible to identify twelve independent SOI reasoning factors, CMU, CMC, CMR, CMS, CMT, CMI, NMU, NMC, NMR, NMS, NMT and NMI as posited by Guilford for the 14+ pupils in the heterogeneous as well as in the homogeneous group.
3. Different factor patterns of reasoning abilities may be noticed in the heterogeneous and homogeneous groups.

#### SELECTION AND CONSTRUCTION OF TOOLS

To start with, the investigation required at least three tests for each of the SOI factors, CMU, CMC, CMR, CMS, CMT, CMI, NMU, NMC, NMR, NMS, NMT and NMI. Twenty-seven of such tests, i.e. three tests for each of the factors, CMC, CMR, CMS, CMI, NMC, NMR, NMS and NMI, two tests for the factor, CMT, and one additional test for the factor, CMI, were already available. The remaining ten tests, i.e. three for the SOI factor, CMU, one for the SOI factor, CMT, three for the SOI factor, NMU and three for the SOI factor, NMT were developed by the present investigator himself. These were developed according to the sample items given by Guilford and Hoepfner (1971, pp. 367-497) and using dichotomous (27 percent high and low) criterion suggested by Harper, et al., (1962).

#### FORMATION OF SAMPLES AND COLLECTION OF DATA

For the purpose of collection of data, ten Government Boys' Senior Secondary schools which were considered to be typical of the population of Delhi students were picked up. From each of these schools, one section of Class IX was selected to constitute the initial heterogeneous sample of 14+ boys.

As Delhi is considered an inflated official colony and as population of South Delhi consisted of the largest number of people belonging to Government and other similar jobs, all the ten selected schools belonged to South Delhi. To obtain the homogeneous sample of students, two criteria were set up. In order to preclude the possibility of the effects due to moderator variables, the first criterion was to pick up the group from schools situated within one officials' colony. In order to preclude the possibility of effects due to uneven maturation of mental ability, the second criterion was to pick up the group from the schools which would be equivalent in terms of means and variances of 'intellectual efficiency' scores. Thus, all such pupils, who belonged to one particular residential colony, R.K. Puram, were picked up from the heterogeneous sample. Further, student's 't' test

for the significance of difference between school means and Fisher's 'F' test for the equality of two 'within' school variances on Raven's Standard Progressive Matrices Scores were applied to pick up equivalent groups in order to form the homogeneous group. The total number of students in the heterogeneous and homogeneous samples was 325 and 146, respectively.

#### ANALYSIS OF DATA AND INTERPRETATION OF FACTORS

The correlation co-efficients indicated that the reasoning abilities as measured by the present set of tests, belonged to a 'positive manifold' both in case of the heterogeneous as well as the homogeneous sample. These correlations also indicated that the tests belonging to a particular SOI category were not only viable measures of that category but, at the same time, provided measures of different facets of that category.

On factor-analysis of the correlation matrices by the principal factor analysis method and rotating according to varimax criterion, seven factors in case of heterogeneous sample and eleven factors in case of homogeneous sample were identified. The seven factors in case of heterogeneous sample were:

- Factor A: General Inference of Semantic Products
- Factor B: Inference of Semantic Mutations
- Factor C: Convergent Production of Semantic Formations
- Factor D: Cognition of Semantic Classes
- Factor E: Inference of Semantic Connections
- Factor F: Cognition of Semantic Implications
- Factor G: Convergent Production of Semantic Implications

The eleven factors in case of homogeneous sample were:

- Factor AM<sub>1</sub> : Cognition of Semantic Units
- Factor AM<sub>4</sub> : Inference of Semantic Referents
- Factor BM<sub>2</sub> : Convergent Production of Semantic Relations
- Factor BM<sub>10</sub> : Convergent Production of Semantic Transformations
- Factor CM<sub>6</sub> : Convergent Production of Semantic Classes
- Factor CM<sub>7</sub> : Convergent Production of Semantic Conformations
- Factor DM<sub>9</sub> : Cognition of Semantic Classes
- Factor EM<sub>5</sub> : Inference of Semantic Agreements
- Factor EM<sub>8</sub> : Convergent Production of Semantic Units
- Factor FM<sub>3</sub> : Cognition of Semantic Implications
- Factor GM<sub>11</sub> : Convergent Production of Semantic Implications

On examination of the factors identified in both the samples in terms of SOI factors, it was found that out of the seven factors identified in case of heterogeneous sample, three were same as SOI factors: CMC, CMI and NMI while four others

emerged as mixed factors. Similarly, in case of homogeneous sample, out of the eleven factors, eight were same as SOI factors: CMT, CMC, CMI, NMC, NMI, NMT and NMI while only three emerged as mixed factors. These results supported the hypothesis that different patterns of reasoning abilities may be noticed due to variations in sampling criteria. Again, these results supported the hypothesis that differentiation of reasoning abilities does take place around 14+ and the differentiated dimensions of reasoning abilities are amenable to identification.

Further, as out of twelve factors posited by Guilford and with which the study was undertaken, only three in case of heterogeneous sample and eight in case of homogeneous sample were identified. Thus, the study did not support the hypothesis that it was possible to identify all the twelve independent SOI factors for the 14+ pupils, but it revealed greater number of SOI factors in case of later group, i.e. for the pupils who were similar with regard to their social context and general intellectual efficiency. Perhaps, apart from sex, age, grade and maturation, a more systematic criterion for social context, and some other criterion of 'nurture' may help to identify the factors similar to SOI factors.

On preparation of a grid showing the factors identified in case of heterogeneous sample along one dimension and the factors identified in the homogeneous sample along another dimension, it was noticed that out of seven factors, identified in case of the heterogeneous sample, six factors got differentiated in case of the homogeneous sample while one emerged identical in both the samples. This revealed a marked differentiation of reasoning abilities due to similarity of social context and equivalence of maturation of mental ability of the subjects.

#### SUGGESTIONS FOR FURTHER STUDY

1. Since the present investigation was restricted to semantic category, investigations may be carried out for figural, symbolic and behavioural content categories.
2. The present investigation was conducted on boys only. Therefore there is need for a similar investigation on similar samples of girls also.
3. Considering that greater number of independent SOI reasoning factors were identified in case of homogeneous sample, investigations may be carried out by using systematic criteria for 'social context' and for 'nurture' (home background, nutritional status, study patterns, etc.) which may well help in identifying clearly differentiated reasoning ability factors in a systematically specified group.
4. Taking note of the finding that pattern of reasoning ability differs for the heterogeneous and homogeneous groups in terms of 'intellectual efficiency' and 'social context', investigations may be carried out on the

relationship of reasoning abilities and scholastic achievement in various subjects separately for such heterogeneous and homogeneous groups.

The prospect of such studies is the fact that schools do vary in terms of their intake—some schools having homogeneous groups and some other heterogeneous groups studying in secondary classes. The teachers on the basis of investigations carried out by other investigators on the relationship of reasoning abilities and scholastic aptitude can plan out their curricula and instructional strategies in order to bring their teaching in consonance with the abilities of children.



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## Research Notes

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### *Insecurity Among High School Students: Effect of Intelligence and Traditionality-Modernity*

(DR) B.G. SUDHA  
TAJ PARVEEN

SOCIAL scientists vary widely in their interpretation of the impact of modern society on the adolescents. Edgar Friedenberg (1959) postulates an essential incompatibility between modern society and adolescence as a unique developmental period. In his view adolescent identity formation proceeds mainly through conflict with society. Since modern technological society emphasises conformity and institutionalisation, idealises the organisation of man, and disparages the very individuality and conflict on which adolescent self-definition depends, he continues it, is bitterly hostile and destructive to the positive goals of adolescence.

The progress of modernisation would be directly related to the pace of educational advances and one sure way to modernise quickly is to spread education, produce educated and skilled citizens and train an adequate and competent intelligentsia.

Many psychologists are concerned with the problems of insecurity among the growing children, and many have studied this phenomenon from various points of view. An individual experiences a sense of insecurity, when he becomes conscious of the expectations of hurt from the world, lack of parental love, trust or belief in any person, and, on the other hand, when a student enjoys approval, appreciation, love and happiness, he would feel secure. It is a condition of one being in safety,

or free from the threat of danger to life or what is highly valued, and Adler uses it in a special sense to connote a condition in which power or conquest is attained without struggle. The psychopathological dimensions of insecurity included (i) pathological reactions such as fears, obsessions and phobia, (ii) a specific character structure in the individual, and (iii) a specific group organisation. Maslow uses the term insecurity syndrome to indicate a situation of a chronic insecurity covering about fourteen symptoms such as feelings of rejection, absence of belongingness and isolation, alarm attitude towards life, sense of suspiciousness, jealousy and hatred, etc. An experience of insecurity is detrimental to the educational and personal growth of an adolescent.

This sense of experience of insecurity would be affected positively or negatively by such psychological factors as intelligence and social factors as modernisation. If a person is intelligent enough to meet the threatening challenges without psychologically getting himself/herself hurt, he can cope with the threat and be free from a sense of insecurity. But when the individual is not able to face the situation, the ever-changing challenges of modernisation would pose a very threat and danger to the existence of the person creating many untold consequences of insecurity and loss.

The rapid changes in society due to the process of modernisation have certain impact on the mental state of the growing individual, and especially in the sense of his well-being and secure. The very unpredictable situation created by the rapid change would result in a sense of insecurity affecting the healthy growth of the child.

There are many studies that have examined the extent of insecurity among school-going children with reference to many parameters such as personality, self-confidence, intelligence, socio-economic status, modernity, child-rearing practices, etc. (Siddiqui, 1980; Basu, 1983; Narayanappa, 1983; Pushan and Siranchi, 1976; Manjula, 1978; Edward, 1973; Krishna and Prasad, 1971). There are many studies which have examined the nature and impact of traditionality-modernity on such factors as achievement, personality problems, adjustment, etc. (Yasmeen, 1983; Srivastava, 1968, 1969; Cunningham, 1973; Sudha and Surekha Kumari, 1983; Mallareddy, 1973; Pramila, 1973; Ahmed, 1973; Vimala, 1982). The studies have revealed many significant dimensions of the inter-relatedness of these factors of intelligence, achievement, problems, sense of security, self-confidence, and modernity-traditionality.

## THE STUDY

In order to examine the combined and main effect of intelligence and traditionality-modernity on the five dimensions of security-insecurity among school-going students, an Insecurity Scale (Sudha and Satyanarayana, 1983), a

Traditionality-modernity Scale (Sudha and Satyanarayana, 1980), a Group Test of General Mental Ability (Jalota) were administered to 300 students from eight high schools of Bangalore city, consisting of 100 students each from Classes VIII, IX and X. All the instruments used were possessing acceptable degree of validity and reliability indices. The technique of two-way analysis of variance with unequal numbers (Tuckman, 1972) was used to analyse the data.

# ANALYSIS AND DISCUSSION

The Insecurity Scale provides indices about the insecurity of the children in five dimensions namely, health, educational, personal, social and economic. Traditionality-modernity provides scores in five dimensions of traditionality and five dimensions of modernity, the set could be arranged into five continuous dimensions of traditionality-modernity. They are conservative-progressive, authoritative-pragmatic, fatalistic-scientific, inhibitive-assertive, and affiliative-alienative.

## Intelligence and Insecurity

TABLE I Mean, SD and t-values for Differences in Means of Insecurity Scores of Students with High, Average and Low Intelligence								
S.No.	Dimensions of Insecurity	Intelligence						t-value
		Low (n = 65)		Average (n = 157)		High (n = 78)		
		Mean	SD	Mean	SD	Mean	SD	
1.	Health	17.33	2.28	17.64	3.11	16.35	3.02	$t_{1,2} = 0.82$ $t_{2,3} = 3.08^{**}$ $t_{3,1} = 2.28^{*}$
2.	Educational	19.56	2.64	18.54	2.58	17.84	3.73	$t_{1,2} = 2.63^{**}$ $t_{2,3} = 1.40$ $t_{3,1} = 3.22^{**}$
3.	Personal	16.64	2.48	16.19	2.99	15.34	2.99	$t_{1,2} = 1.16$ $t_{2,3} = 2.06^{*}$ $t_{3,1} = 2.84^{**}$
4.	Social	17.16	2.30	16.88	2.79	15.79	3.09	$t_{1,2} = 0.78$ $t_{2,3} = 2.63^{**}$ $t_{3,1} = 3.03^{**}$
5.	Economic	17.63	2.88	16.68	2.85	15.74	3.15	$t_{1,2} = 2.24^{*}$ $t_{2,3} = 2.22^{*}$ $t_{3,1} = 3.75^{**}$
(* p less than 0.05; ** p less than 0.01)								



The students who were high on intelligence were found to have less insecurity than the other two groups in all the five dimensions, namely health, educational, personal, social and economic, whereas the girls with low intelligence were having the highest degree of insecurity in all these dimensions. Intelligence appears to affect insecurity adversely, resulting in less of insecurity among high intelligent groups of students.

### *Traditionality-Modernity and Insecurity*

TABLE 2 Mean and SD of Insecurity Scores of Students Grouped Under Low, Average and High on Traditionality-Modernity Dimensions										
Traditionality-Modernity	Insecurity									
	Health		Educational		Personal		Social		Economic	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1. Conservative										
Low (n = 103)	17.05	3.00	18.28	2.76	15.82	2.84	16.69	2.62	16.47	2.88
Average (n = 121)	17.30	2.87	18.70	3.04	16.05	2.78	16.58	2.77	15.69	2.81
High (n = 76)	17.35	3.05	18.80	3.00	16.42	3.12	16.73	2.98	16.80	3.21
2. Authoritative										
Low (n = 100)	16.69	3.51	17.43	3.32	15.10	3.17	16.05	2.97	15.57	2.90
Average (n = 130)	17.66	2.65	19.20	2.70	16.48	2.65	16.90	3.00	16.97	2.98
High (n = 70)	17.25	2.05	19.08	2.45	16.68	2.44	17.08	2.88	17.57	2.61
3. Fatalistic										
Low (n = 75)	17.16	2.26	18.98	2.35	16.24	2.23	16.84	2.27	17.72	2.71
Average (n = 144)	17.37	2.95	17.53	3.15	16.07	3.15	16.59	2.98	16.34	2.87
High (n = 81)	17.09	3.30	18.30	3.01	15.90	2.80	16.61	3.00	16.18	3.05
4. Inhibitive										
Low (n = 75)	17.00	3.18	18.36	2.89	15.72	2.76	16.05	2.78	16.00	2.72
Average (n = 131)	17.38	2.64	18.58	2.75	16.06	2.80	16.91	2.65	16.00	2.21
High (n = 94)	17.24	3.00	18.76	3.16	16.26	3.08	16.79	2.97	16.82	3.21
5. Affinitive										
Low (n = 80)	16.93	3.13	18.18	3.06	16.03	2.82	16.57	2.64	16.36	2.84
Average (n = 119)	17.33	2.73	18.60	2.82	16.00	2.88	16.73	2.79	14.60	2.87
High (n = 101)	17.35	2.87	18.77	2.99	16.17	2.98	16.74	2.99	16.91	3.10

The obtained  $F$  values in the following instances were significant:

1. Main effect of authoritative on educational insecurity ( $F = 7.57$ )
2. Main effect of authoritative on personal insecurity ( $F = 7.07$ )
3. Main effect of authoritative on economic insecurity ( $F = 6.65$ )
4. Main effect of fatalistic on economic insecurity ( $F = 6.55$ )
5. Interaction effect of conservative and intelligence on social insecurity ( $F_{4,291} = 2.41$ ,  $p$  less than 0.05)

These five dimensions of the Traditionality-modernity Scale reflect the traditionality aspect and hence a high score in this would indicate a higher degree of traditionality. The comparison of the marginal mean values indicated that the traditionality dimensions of conservative, inhibitive and affinitive did not bring about any variations in the insecurity of the students, though conservative with intelligence had a combined effect on the social insecurity of the students. The students who were low on the authoritative dimension of traditionality were less insecure on the educational, personal and economic dimensions than those who were average and high on this dimension. The average and high groups did not differ between themselves in these three aspects of insecurity.

The students were high on fatalistic dimensions of traditionality and those who were average on this dimension were having less insecurity than those who were low on the fatalistic dimension, but not differing between themselves.

TABLE 3 Mean and SD of Insecurity Scores of Students Grouped Under Low, Average and High on Traditionality-Modernity Dimensions										
Traditionality-Modernity	Insecurity									
	Health		Educational		Personal		Social		Economic	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1. Progressive										
Low (n = 80)	17.00	2.04	18.60	2.41	16.45	2.30	16.45	2.38	17.17	2.62
Average (n = 128)	17.20	3.44	18.60	3.25	15.97	2.97	16.63	2.87	16.78	2.96
High (n = 92)	17.43	2.47	18.54	2.86	15.86	3.16	16.89	3.07	16.50	3.06
2. Pragmatic										
Low (n = 94)	17.43	3.13	18.72	2.93	16.28	2.86	16.60	2.78	16.41	2.81
Average (n = 126)	16.92	2.94	18.20	2.82	15.92	3.12	16.36	3.00	16.46	3.04
High (n = 80)	17.53	2.52	18.98	3.62	16.05	2.43	16.87	2.54	17.17	2.84
3. Scientific										
Low (n = 76)	17.35	3.04	18.35	3.07	16.11	2.91	17.06	3.03	16.46	2.68
Average (n = 130)	17.35	2.82	18.63	2.83	16.21	2.70	16.30	2.78	16.70	2.90
High (n = 94)	16.97	2.83	18.70	2.95	15.93	3.12	16.57	2.66	16.71	3.26
4. Assertive										
Low (n = 90)	17.35	3.06	16.46	2.84	14.08	2.84	16.45	3.11	16.13	2.86
Average (n = 125)	17.06	3.03	18.42	3.14	15.60	3.08	16.60	2.39	16.57	3.05
High (n = 85)	17.40	2.57	19.25	2.64	16.43	2.66	16.97	2.71	17.31	2.85
5. Alienative										
Low (n = 76)	16.85	2.42	18.68	2.55	16.48	2.21	16.20	2.26	16.76	2.81
Average (n = 137)	17.70	3.11	18.50	3.06	16.11	3.01	17.01	2.98	16.60	2.89
High (n = 87)	16.85	2.86	18.62	2.99	15.54	3.15	16.42	2.94	16.77	2.88

The cell mean differences and their comparison revealed that the group who had the highest degree of insecurity in the social dimension was the low intelligent-high conservative group whereas the least insecure group was high intelligent-low conservative group. The descending order of the groups was interesting, the average-intelligence, average-conservative being in the middle, the low intelligent was on the higher level of insecurity whereas the higher intelligence group was on the lower level of insecurity. This would indicate a negative influence of intelligence on social insecurity of students.

The obtained  $F$  values in the following instances were significant:

1. Interaction of progressive and intelligence on economic insecurity ( $F = 2.46$ ,  $p$  less than 0.05).
2. The main effect of alienative dimension of modernity on health insecurity ( $F = 3.27$ ,  $p$  less than 0.05).
3. The main effect of alienative dimension of modernity on the personal insecurity ( $F = 3.11$ ,  $p$  less than 0.05).
4. Interactive effect of alienative of modernity and intelligence on economic insecurity ( $F = 5.16$ ,  $p$  less than 0.01).

The students who were low on the progressive dimension of modernity as also low on intelligence were found to have the highest degree of economic insecurity (19.00) whereas the students who were high on intelligence but low on progressive were found to have the least degree of economic insecurity (14.90). These two groups were differing significantly from the other groups who were in between these two extremes.

The dimensions of pragmatic, scientific, and assertive of modernity did not bring about any differences in the insecurity of the students either alone or with intelligence.

But the factor of alienative dimension of modernity was found to affect the health, personal and economic insecurity of the students. The average group in alienative were found to be having more health insecurity than the other two extreme groups. The low group on alienative was having more intensity in personal dimension than the high alienative group. The low-intelligence low-alienative group was having the highest insecurity in economic aspects, whereas the high-intelligence low-alienative was having the least insecurity in economic dimension. These two groups did differ from others who were in between these two extreme groups.

## DISCUSSION

The study has revealed that intelligence and traditionality-modernity appear to influence the extent of insecurity experienced by the high school students. Intelli-

gence appears to be an inhibitive factor of insecurity as the students with a high level of intelligence were found to experience less intensity of insecurity in all the five dimensions studied.

The five dichotomous dimensions of traditionality-modernity seem to have some effect on the degree of insecurity of the students, as a few of them brought about differences in certain dimensions of insecurity both individually and with intelligence. As there was no systematic trend noticed in the patterns of influence, the results are not conclusive. But, there is a need to further examine these factors.

The students reported the highest degree of insecurity in the educational dimension (18.58), whereas they had the least degree of insecurity in the personal dimension (16.06). The other two, namely health (17.26) and economic (16.64) and social (16.66) were in-between these two extremes.

There is a need to reduce the educational insecurity among school students by developing a number of programmes, such as transactional analysis, assertive communication skills, personality development programmes, relaxation techniques using the silva method of any Indian yoga techniques so that the children can grow and learn without any sense of insecurity or fear. These objectives could be achieved by establishing in every school a Cell for Guidance and Counselling and by paying individual attention to these children.

The instrument has not revealed any serious problem of insecurity among the children studied as the obtained mean value of insecurity is just below the average expected value of insecurity.

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### *Analysis of Teaching Behaviour Pattern of Experienced Science Teachers*

(DR) NANDITA BASU ROY

IN this nuclear age, we are in great demand with our present education. To present a good scientific education, we should make our teachers well equipped mentally, morally, physically and also give them a sound education of the recent facts of science.

During the last twenty years or more, attempts have been made by the educationists, through systematic observations, to make the teacher aware of his performance. They have provided 'mirrors' for a teacher to have a glance at his performance in the classroom. The attempts made by Flanders (1960) have proved to be very successful.

Flanders (1970, p. 1) views teaching as the 'chain of classroom events' leading to reciprocal contacts between the teacher and the pupil, as the series of events which occur one after another. Each event occupies a small segment of time and at a particular moment it influences what is to follow and, in turn, is influenced by what precedes. Teachers can analyze classroom interaction in order to obtain information about the chain of events and thereby they can analyze their own acts of teaching behaviour. This will help them, in the first instance, to develop and control their teaching behaviour and, secondly, to investigate relationships between classroom interaction and teaching acts, so as to explain some of the variability in the chain of events.

### OBJECTIVES

The main objectives of the study were:

1. To study the teaching behaviour pattern of experienced science teachers.
2. To compare the teaching pattern of male and female science teachers.
3. To compare the teaching behaviour pattern of science teachers with that of social science teachers.

### BASIC ASSUMPTIONS

The basic assumptions of the study were:

1. The verbal behaviour of the teacher is the basic of most of the interaction between the teacher and the pupils.
2. The classroom verbal behaviour of the teacher can be observed objectively.
3. A teacher develops a particular teaching behaviour pattern after a certain number of years in service.

### DELIMITATIONS

The topic was delimited on the following lines:

1. The study was confined to the teachers of Varanasi city only.
2. The study was confined to the secondary level teachers (IX and X grades) only.
3. Verbal behaviour was used as the sole basis to assess teaching behaviour in the classroom.

## METHODOLOGY

*Sample*

The sample of the study comprised of all science teachers, 24 in number, teaching Physics, Chemistry or Biology at the secondary and higher secondary state in the schools of Varanasi City.

TABLE I Percentage of Teacher Behaviours										
Category	1	2	3	4	5	6	7	Behaviour Categories		
								8	9	10
1	—	—	0.65	1.96	72.6	4.87	—	8.8	—	10.112
2	—	—	5.5	6.48	84.87	—	—	1.27	—	1.905
3	—	4.69	16.8	23.98	12.25	2.216	0.78	23.9	1.3	1.4
4	0.5	3.8	19.23	12.5	15.26	1.6	—	11.5	31.7	4.76
5	—	0.6	5.65	8.4	72.27	4.97	0.26	7.67	—	—
6	—	0.34	4.87	15.8	53.6	4.6	3.6	16.91	—	—
7	—	5.4	16.2	17.7	12.8	3	0.7	26	—	17
8	—	5.37	16.24	17.68	12.78	3.106	0.716	26.86	—	17.32
9	—	0.15	3.9	5.5	61.1	1.33	0.15	22	—	5
10	—	0.16	4	5.6	62.86	—	0.16	18.64	1.68	6.83
11	—	6.31	24.7	16.62	11.8	3.02	2.06	18.26	—	17.17
12	—	7.0	12.6	23.3	13.1	1.3	2.7	29.2	—	10.8
13	—	0.17	3.56	3.56	80.92	1.782	0.713	9.269	—	—
14	—	2.89	2.63	20	30.8	1.3	1.1	25.8	13.4	2.1
15	—	5.2	6.7	16.9	15.7	6.9	6.3	25.9	9	6.9
16	—	1.0	1.5	10.9	49.6	5.9	0.3	12.2	1.0	17.6
17	—	—	3.5	5.65	60.07	—	—	0.17	8.80	21.2
18	0.45	3.82	19.14	11.33	15	1.53	—	15.46	30.01	3.215
19	—	2.05	1.67	11.99	70.7	1.30	—	7.27	1.119	4.66
20	—	3.20	0.337	6.08	83.95	0.34	—	3.20	—	2.87
21	—	2.30	7.5	5.7	57.6	2.5	1.4	13.4	—	9.6
22	0.2	1.8	4.2	13.8	55.4	1.6	0.9	12.2	0.2	9.5
23	1.0	8	11.2	15.7	7.5	3.9	6.5	16.2	1.5	14.5
24	—	2.2	9	35.5	4.5	1.3	10.6	30.4	—	7.5

*Data*

The data were collected with the help of the tape-recorder, the classroom of each teacher was visited twice and matrices made. Then, composite matrices were made for male, female and all teachers (Table 1), 14 indices were calculated, flow diagrams and histograms were made. Personal data sheet was used to find the particulars of teachers.

## MAJOR FINDINGS

TABLE 2	
Description of Tool	Tool Used
1. Personal data sheet	For finding the particulars of teachers
2. Matrices based on FIACS	From the data, matrices were made Total No. 24

TABLE 3		
Ratio	Experienced Science Teachers	American Norms
Teacher Response Ratio (TRR)	77.4	42
Teacher Question Ratio (TQR)	14.4	26
Pupil Initiation Ratio (PIR)	13.33	34
Content Cross Ratio (CCR)	72.2	55
Steady State Ratio (SSR)	54	50

TABLE 4	
Total Teacher Talk for the Sample Varied Between : 32.5 to 90.7	
Total Student Talk	9.2 to 45
Content Cross Ratio	26 to 82
Steady State Ratio	45 to 90

## CONCLUSIONS

1. Some of the behaviours such as lecturing, asking questions, accept feelings, are more commonly used by almost all the teachers.
2. Praise and reward (Category 2) acceptance and clarification (Category 3) and asking questions (Category 4) are more used by indirect teachers.



3. Lecturing (Category 5) is more used by direct teachers than indirect teachers.
4. Accepts feelings (Category 1), giving direction (Category 6), criticizing or justifying authority (Category 8), pupil initiation (Category 9) and silence or confusion (Category 10) are equally used by both direct and indirect teachers.
5. Direct female teachers are more in number as compared to indirect male teachers.
  - i. Total teacher talk for the sample varies between (0.60 to 0.91).
  - ii. Total student talk for the sample varies between (0.09 to 0.10).
  - iii. I/D for the sample varies between (0.08 to 2.7).
  - iv. Teacher Question Ratio for the sample varies between (0.06 to 0.92).
  - v. Steady State Ratio for the sample varies between (0.61 to 0.88).
  - vi. Content Cross Ratio for the sample varies between (0.35 to 0.90).

#### SUGGESTIONS FOR FURTHER RESEARCH

On the basis of the findings and conclusions of this study the investigator proposes the following suggestions for further research:

1. Since the study is based on a small sample, the investigator cannot draw only firm conclusion about the larger population. In order to draw a conclusion so that it becomes a generalization about a large population, the study should be replicated with a large sample.
2. Some very highly scientific method should be propagated in order to find the actual situations in our classrooms.
3. (a) A comparative study may be done, keeping sex, experience and teaching subjects as variables, and also experienced and fresh teachers.
- (b) It will be important to go beyond verbal interaction by developing more and better ways of taking into account the full range of classroom events.
- (c) Measurement of classroom processes may be improved. One way may be to go beyond simple frequency scores scaled per unit of time. Ratio or proportion scores allow better comparisons across teachers than frequency scores; other measurement needs include better ways to express teacher behaviour that occurs in sequences and more attention to the quality of teacher behaviour, not just its quantity.

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*Socio-educational Correlates of Creativity among Secondary School Students in Arunachal*

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THE third world nations are committed to human resource development. The development of human resources depends mostly on the detection and fostering of the human potential. As such, talent development is a necessary pre-requi-

site for planned progress and development. Indian planners rightly emphasized the development of human resources through educational programmes. The development over the last two decades has shown that desired results have not been achieved because neither the resources nor the measures for restructuring were commensurate with the imaginative and purposeful thrust of the education. Till recently, the stress has been placed on the intellectual gains. Creative potential, the most precious human resource, has not been paid much attention. Nevertheless, it has now been realised that it is not merely intelligence but also creativity which is responsible for overall progress.

Scientific interest in the study of creativity began only very recently although creative thinking ability has been considered the highest of mental functions and creative production the peak of human achievement. According to Wechsler (1958), "Wisdom and experience are necessary to make the world go round; creative ability to make it go forward". Barron (1969) points out that "our capacity for creative thought and action may literally make all the difference in the world... Human creativity may prove to be the key to success or failure in mankind's quest for knowledge, in his journey beyond the bounds of the sure and seen, in his exploration of the unknown". Toynbee (1964), the famous historian, considered creativity as the man's greatest asset and one of the most valued qualities. It is the type of talent that can create history through reshaping man's world. Patrick (1955) pronounced creativity as one of the most valuable human resources which can even cope up with life's stress and strain. The creative mental ability can overwhelm even tensions and breakdowns of day-to-day life. The survival and progress of any society is closely dependent upon how it can conserve and utilise the precious human resource, the creative potential. Creativity is often explained in terms of a process or a product but can be defined in terms of persons and their individual characteristics. One leading researcher, Torrance (1966), has described creative thinking as "a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on, identifying the difficulty, searching for solutions, making guesses, or formulating hypotheses about the deficiencies, testing and retesting these hypotheses, and possibly modifying and retesting them, and finally communicating the results".

Stein (1974) suggested that creativity results in a novel work that is accepted as tenable or useful by a group at some point in time. De Haan and Havinghurst (1961), after a review of a number of definitions of creativity, state that "Creativity is the quality which leads to the production of something new and desirable. The new product may be new to society or merely new for the individual who creates it". Drevdahl (1958) defined creativity as the capacity of a person to produce compositions, poems, or ideas of any sort which are essentially new or novel and previously unknown to the producer.

### NEED FOR THE STUDY

Not much work seems to have been done in India in the field of creativity. The studies undertaken are mainly confined to the urban and advanced regions (Raina, 1969; Paramesh, 1972). In a tribal state like Arunachal Pradesh, the studies are conspicuous by their absence. Systematic empirical explorations to understand the concept of creativity and its correlates are needed for planning educational programmes of talent development in India, especially in remote tribal backward regions. This view has been upheld by the Education Commission (1964-66) which states that 'talent has to be located early and allowed to grow in the best atmosphere and under the best teachers'. This felt need for identification and fostering of the tribal talent prompted the investigator to undertake the present research.

### THE STUDY

The present research was designed to examine the creative thinking ability of the secondary school students in Arunachal Pradesh. The relationship between creativity and select socio-educational variables was also studied. The socio-educational correlates specifically taken up for research were sex, age, birth order, parental education, parental occupation, socio-economic status, family facility, mass media exposure, literary interests, leisure time activities and the type of school in which they studied.

The study was undertaken primarily to realise the following objectives:

1. To measure the level of creative thinking ability among the secondary school students.
2. To find out the relationship of select socio-educational variables with creative thinking ability.

### HYPOTHESES

The study had the following hypotheses:

1. For an unselected but representative sample of secondary school students, sub-groups based on sex, age, birth order, socio-economic status, family facility and media exposure will not show any statistically significant difference in their creative thinking ability.
2. There will not be any significant difference in the creative thinking ability of students belonging to different types of school, having different past-times, social/literary interests and levels of parental education.

## THE SAMPLE

The sample for the study consisted of 200 secondary school students selected at random from two Government High Schools and one Central School of Lower Subansiri and West Siang Districts of Arunachal Pradesh.

## TOOLS USED

The following tools were employed to collect data:

1. Creativity test developed in the Department of Education, Norui-Eastern Hill University, Aizawl (1987), adapted to Arunachal Pradesh.
2. Personal data sheet specially devised for the study.
3. Socio-Economic Status Index (SESI) (Lalrinkimi, 1988).
4. Index for Media Exposure (IME) (Lalrinkimi, 1988).

## DATA COLLECTION

The collection of the data spread over almost one month. The investigator personally visited the schools selected for the study. The investigator took the help of the teachers who were given instruction about the procedures to be adopted during the administration of the tests. The personal data sheet was given to the students first. The creativity tests were given after the personal data sheet was filled-in and returned by the students. The students were requested to do the practice items on each of the sub-tests on creativity and to follow the instructions carefully while taking the test.

## TREATMENT OF DATA

The scores on the creativity test were taken as criteria for classifying the students into high and low creative groups. The students obtaining the mean score on the creativity test and above constituted the high creative group ( $N = 88$ ) and those possessing less than the mean score formed the low creative group ( $N = 112$ ). Groups were also formed on variables such as socio-economic status (SES), Family Facility (FF), Media Exposure (ME), following the same procedure after obtaining scores as per the prescribed scoring schemes. In order to find the relation between the select variables under research, the creativity and socio-educational variables such as sex, age, birth order, parental education (father), parental education (mother), parental occupation, socio-economic status (SES), family facility (FF), media exposure, literary and social interests, pastimes and type of

school, the data were arranged in appropriate contingency tables. Chi-square test was applied and co-efficient of contingencies ( $C$ ) was calculated. The two-tailed test of mean difference for large independent samples was applied to examine the difference in the creativity scores of the student belonging to various sub-groups on the socio-educational variables under study. For this, mean, standard deviation and critical ratios were computed. The results are summarised in Table 1.

## FINDINGS

1. The results of the research revealed that the male and female students did not show any significant difference in their creative thinking ability. ( $\chi^2 = 1.062$ ,  $df = 1$ ,  $C = 0.072$ ,  $p > .05$ )
2. The students belonging to high (15 years and above) and low (below 15 years) age groups failed to differentiate in their creative thinking ability. ( $\chi^2 = 0.247$ ,  $df = 1$ ,  $C = 0.033$ ,  $p > .05$ )
3. The last born were found to be definitely superior in creative thinking ability when compared to the middle born and first born children.
4. Father's education was found to foster higher creative thinking ability, the students with educated parents attained higher creativity scores than those with illiterate parents.
5. Mother's education also contributed to better creative thinking ability among the children as per the results of the present study. The children of educated mothers possessed higher creativity than those of illiterate mothers.
6. Parental occupation was not found to be a factor related to the creativity of children. ( $\chi^2 = 1.644$ ,  $df = 2$ ,  $C = 0.090$ ,  $p > .05$ )
7. A moderately high positive linear relationship was observed between the variables of creativity and socio-economic status. The students from high socio-economic background were definitely superior to those from lower strata in their creative thinking ability.
8. Family facility was found to foster creativity. The students with higher family facility score possessed a higher creativity score than their low family facility counterparts.
9. Exposure to mass media seemed to have a positive significant effect on the creative thinking ability of children. The students exposed high to media had an advantage over the low exposed students in their creative disposition.
10. The students with literary interests gained superiority in creative thinking when compared to those with social and cultural interests.

TABLE 1  
Creativity vs Select Socio-economic Variables

Variables	$\chi^2$	df	p	C	Groups	N	M	SD	CR	p
Birth Order	13.334	2	.01	0.250	A. First born	67	50.72	6.04	A&B 2.53	.05
					B. Middle born	70	53.93	7.12	B&C 0.35	NS
					C. Last born	52	56.11	7.08	3.57	.01
Father's Education	9.881	1	.01	0.216	Illiterate	139	49.60	7.81	10.45	.01
					Educated	61	62.00	6.73		
Mother's Education	7.849	1	.01	0.194	Illiterate	147	51.60	8.466	7.94	.01
					Educated	43	59.87	5.014		
Socio-economic Status (SES)	6.807	1	.01	0.256	Low SES	116	57.70	7.002	4.39	.01
					High SES	84	55.66	6.385		
Family Facility (FF)	5.261	1	.05	0.160	Low FF	118	52.50	6.95	2.23	.05
					High FF	82	54.64	6.70		
Media Exposure (ME)	3.838	1	.05	0.137	Low ME	106	52.18	7.28	2.53	.05
					High ME	94	54.73	6.90		
Interests	7.403	1	.01	0.188	Literary	92	56.02	7.01	5.47	.01
					Social	108	51.13	6.22		
Pastimes	17.453	2	.01	0.283	A. Recreational	73	51.91	6.98	A&B 3.48	.01
					B. Informative	38	58.01	6.41	B&C 3.39	.01
					C. Socio-cultural	89	52.61	6.73	A&C 0.59	NS
Type of School	5.513	1	.05	0.161	Government	123	54.09	7.00	1.98	.05
					Central	77	52.24	6.43		

11. The students with high creative thinking ability sported pastimes of informative nature as against the recreational and socio-cultural leisure time activities of the low creative students.
12. The type of schools in which the students studied was also found to influence their creative thinking ability. The government school students had an edge over the central school students in creativity.

The prediction in hypotheses 1 and 2 was rejected with respect to such variables as birth-order, parental education, socio-economic status, family facility, media exposure, literary/social interests, pastimes and type of school. Since the sub-groups for age, sex and parental occupation failed to show statistically significant difference in creativity scores, the null hypotheses could not be rejected in case of the above variables.

## DISCUSSION

The present study is a pioneering effort to promote creativity among students in Arunachal Pradesh. The research findings have great educational significance with respect to identification and development of talent in this tribal state of North-East India. As per the findings of the present study, there are no significant sex and age differences in the creative thinking ability of children. These findings lend support to several investigations involving samples ranging from elementary through secondary school students which indicated that there were no sex differences in creativity (Dutta, 1982; Simpkins and Eisenman, 1968; Kogan, 1974; Raina, 1982). This diminishing sex difference probably is due to the social trend in tribal cultures to accord equal status and treatment to children of both sexes in rearing them as well as educating them. Further, the spirit of adventure reigns supreme in the thought and behaviour of tribal children beyond the age of twelve, and the transitional adolescent stage between 12 to 18 years is considered to be full of optimistic aspirations for the future.

Birth order and socio-economic background seemed to exercise substantial influence on creativity. Roe (1953) rated the chances of first born very high to become creative. However, researches by Schaefer and Anastasi (1970) and the results of the present study do not uphold this view. The last born were found to sport a higher level of creativity when compared to the first and middle born. The children hailing from families with better facilities and superior socio-economic background were observed to possess higher creative thinking ability than those with less family facility and socio-economic status. These differences in creativity can be attributed to the differential treatment accorded to them. Homes with better family facility and socio-economic status may provide positive reinforcements, promote the need for achievement and afford to better child-rearing practices



which play a crucial role in the development of creativity (Smith, 1966; Feld, 1967). The cozy, cojoling and carvy attitude of the parents and the elder siblings may become a bonus for the later borns to become creative. The encouragement and the democratic liberal outlook of the parents and elders may lead to creativity among the children. This view was further strengthened by the findings of the present research as the children of educated parents emulated higher creativity than those of the illiterate parents. Father's and mother's education proved as positive factors fostering creativity among the children.

The study acknowledged the creative children's interest in literary activities and found them engaged in pastimes such as reading, writing, which are of informative in nature. Mass media emerged as another main-spring of creativity. Openness to innovation and change and widening of the range of experiences through media exposure may facilitate creative thinking ability among children. Another significant finding of the study was that the students from the government schools showed an edge over those from the central schools in creativity. Permissive, non-restrictive, non-dogmatic, and democratic atmosphere prevalent in the government schools may provide a congenial atmosphere for promoting divergent thinking ability among the students. On the other hand, directive, highly restrictive, pedantic and impersonal nature of the central schools may stifle the creative thinking ability of children at the expense of connative, convergent and result-oriented academic dispositions.

The research on creativity and the results of the present study reveal that the creative mind interacts vigorously within the nexus of supportive and stimulating environment. A child is constantly influenced either by his home or school environment. Therefore, creative development can be ensured if the dogmatic, authoritarian, restrictive and pedantic influences are removed from the school and family situations. A permissible and conducive climate has to be generated which can develop individual initiative, spirit of inquiry, taste for exploration, problem-solving ability and inquisitiveness among the children.

The following are certain recommendations which can enrich the creative behaviour of children in school and family settings:

1. Assist the children to assess and admit their own feelings, thoughts and actions.
2. Guide the children in their thinking process for creative productions and innovative endeavours.
3. Acknowledge and appreciate the children for being different, unusual and unique in their responses.
4. Make the children realize that certain problems have no easy answers and critical thinking is a pre-requisite for creative problem-solving.

5. A number of alternative solutions are possible for a problem and insist the children not to choose the immediate easiest answers.
6. Recognition and reward for creative responses should be encouraged.

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### *Satisfaction with Life and Life Goals of Indian Youth*

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YOUTH is a psychological stage of development emerging between adolescence and adulthood and characterized by relatively specific dimensions of consciousness (Keniston, 1975). Youthhood, a transient stage, is a period of training and acquisition of skill; a stage of preparation for future life. The role that is assigned to youth is bound to be a transitory role, and is to be viewed not in isolation or independent of the needs and goals of a given society (Oommen, 1990). This stage is a time when earlier socialization and acculturation is self-critically analyzed, and massive efforts made to uproot the now alien trace of historicity, social membership and culture. Millions of young people today are neither psychological adolescents nor sociological adults; they fall into a psychological no man's land, a stage of life that lacks any clear definition. In terms of polarities of Erikson (in Keniston, 1975) the central developmental possibilities of youth have been defined as individuation versus alienation and also identity confusion (Sinha, 1979). The concept of identity confusion, as defined by Erikson, denotes a person's uncertainty about his future role in society, as well as a sense of discontinuity between his personal past and his future. As experienced subjectively, it means a feeling of fragmentation, of indecision, and of isolation from social interpersonal contacts. Such confusion is reflected in a variety of psycho-social disorders such as anxiety, anomie, despair, depersonalization, meaninglessness, isolation, loneliness, a feeling of anonymity and pessimism, all of which seem to characterize contemporary youth (Sinha, 1979). Apter (1965) has pointed out that the society where youth are alienated from the intellectuals has to go in for revolutionary upsurge, even mock. In societies where youth find it difficult to establish their identity, they would try to seek it by revolt against the system. Damle (1989) states that the rebellion of the youth is basically a reflection of the

growing gulf between the young and the old. As a result, Gangrade (1990) points out the bonds of understanding and sympathy have snapped and the youth are sullen and rudderless while they become needlessly depressed and embittered. Thus, the accepted value systems and identification patterns are in a flux which result in considerable confusion and, in some cases, result in psychopathological manifestations (Ramanujam, 1979). There is no doubt that youth symbolise physical and mental energy as well as freshness of outlook and they are supposed to be imbued with the ideology of change or rather radical transformation.

In India, most college-going young men and women are an anxious and confused lot, because they are living under the strain of typical middle-class pressures and the tensions of a warped education system. They do not know where to look for intellectual and emotional strength (Kumar, 1990). In addition, the psychological problems of youth are experienced as most overwhelming when they seem to block change: thus, youth grows panicky when confronted with the feeling of "getting nowhere", of "being stuck in a rut" or of "not moving" (Keniston, 1975).

To have a realistic picture about our youth it seems important to understand the attitudes, values, life goals and extent to which the youth are satisfied with life since it is they who are the winning force which will transform the character and the values of the culture before long. Therefore, it will be rewarding to understand the life goals of the youth who are satisfied with life and those students who are dissatisfied with life. The research in this area will provide reliable information to the dominant establishment so as to satisfy the aspirations of the young and, in the process of doing so, transforming itself to a larger, wiser and more purposeful segment of Indian society (Gangrade, 1990).

## METHOD

### *Subjects*

The subjects of this study were undergraduates from four different colleges affiliated to the University of Delhi. A total of 415 subjects were studied, out of which 264 were female and 151 male undergraduates. These students were studying in the faculties of Science, Commerce, Arts and Management. Details about the sample composition are presented in Table 1.

It may be noted from this table that the mean age of the subjects is 18.30, with a range of 17-20 years. However, the mean age of males is 18.47 and that of females it is 18.20. The age-range of the two groups is same.

Most of the female subjects were Hindus (88 per cent). However, there were Sikhs (8 per cent), Muslims (2 per cent), Christians (1 per cent) and others (1 per

cent). The faculty-wise distribution of the subjects indicates that 47 per cent studied Arts, 28 per cent Science, 19 per cent Commerce and 5 per cent Management.

TABLE I Sample Composition				
Age	N	Mean	Ranges	
Females	264	18.47	17-20 years	
Males	151	18.20	17-20 years	
Total	415	18.30	17-20 years	
Religion	Females		Males	
	N	%	N	%
Hindus	233	88	140	92
Muslims	5	2	1	1
Sikhs	22	8	8	5
Christians	2	1	1	1
Others	2	1	1	1
Faculty		%		
Science		28		
Commerce		19		
Arts		47		
Management		5		

## INSTRUMENT

In order to test the current version of the Multiple Discrepancies Theory (MDT), a questionnaire which was an extended version of that of Michalos (1980, 1982, 1983) was used. According to this theory, happiness (*H*) and satisfaction (*S*) are functions of perceived gaps between what one has had in the past, expected to have three years ago, expects to have after five years, deserves and needs. The theory explained 49 per cent of the variance in *H*, 53 per cent in global *S* and 50 per cent or more in seven out of 12 domains. The domains studied were health, finances, family, job, friendship, housing, area, recreation, religion, self-esteem, transportation and education.

The assessment device used to collect the data was Life Goals Inventory. It consists of 35 items pertaining to different goals and aspirations of the students. The specific goals fall into three broad categories:

- Vocational : Such goals include making a theoretical contribution to science; becoming an expert in finance and commerce; becoming a community leader.
- Social : Helping others who are in difficulty; being a good parent; becoming a community leader.
- Personal : Becoming happy and content; being a good parent; becoming a community leader.

Each of the 35 specific life goals items was rated by the subjects on a four-point scale (of little or no importance, somewhat important, very important and essential for you). Scores ranging from 1 to 4 were assigned to these responses, so that high score indicates a high degree of importance.

## RESULTS

The results regarding the life goals of the satisfied and dissatisfied female and male youth are presented in Tables 2 and 3, respectively. The tables present means, standard deviations and *t* values.

Items	Mean	SD	Mean	SD	<i>t</i>
Becoming happy and content	3.74	0.43	3.33	0.48	2.16**
Becoming well-off financially	3.37	0.38	3.16	0.68	1.50
Inventing or developing a useful device	2.00	0.90	1.33	0.74	1.75
Helping others who are in difficulty	3.18	0.72	2.33	0.47	2.84**
Becoming accomplished in the performing arts	2.55	1.13	2.33	0.94	0.69
Developing a meaningful philosophy of life	2.62	0.90	2.50	1.50	0.26
Becoming an authority on a special subject of my field	3.03	0.92	2.83	1.06	0.48
Doing something which will make my parents proud of me	3.44	0.52	2.66	0.94	1.05
Making sacrifices for the sake of the happiness of others	2.70	0.93	2.16	0.68	1.37
Becoming an outstanding athlete	1.33	0.46	2.16	1.21	2.94**
Becoming a community leader	1.37	0.72	1.50	0.76	0.41
Becoming influential in public affairs	2.07	0.93	1.83	0.68	0.61
Following a formal religious code	1.88	0.91	1.16	0.37	1.94
Having the time and means to relax and enjoy life	3.29	1.01	2.83	0.68	1.08
Making a theoretical contribution to science	1.77	1.06	1.50	0.76	0.60
Making a technical contribution to science	1.70	1.04	1.66	0.94	0.08

Writing a good fiction	1.81	0.86	1.50	0.76	0.83
Being well-read	3.07	0.93	2.83	1.06	0.57
Becoming a mature and well-adjusted person	3.51	0.73	3.33	1.10	0.51
Obtaining awards or recognition	3.14	0.89	2.50	0.95	1.25
Never being obligated to people	1.96	0.99	2.50	0.95	1.63
Keeping in good physical condition	3.44	0.56	3.16	0.68	1.09
Producing good artistic work	2.77	0.91	2.83	1.06	0.14
Becoming an accomplished musician	2.07	1.15	2.16	1.21	0.17
Becoming an expert in finance and commerce	2.70	0.97	2.00	1.00	1.64
Keeping up-to-date with political affairs	2.74	1.14	2.50	0.95	0.49
Being well-liked	3.48	0.68	3.50	0.76	0.06
Being a good husband or wife	3.62	0.67	3.50	1.10	0.36
Being a good parent	3.77	0.82	3.33	1.10	0.52
Finding a real purpose in life	3.66	0.54	3.83	0.37	0.75
Being active in religious affairs	2.03	0.88	1.66	0.74	0.98
Having executive responsibility for the work of others	2.29	0.95	1.50	0.76	1.95
Avoiding hard work	1.59	0.82	1.66	1.10	0.18
Engaging in exciting and stimulating activities	2.88	0.95	3.16	0.68	0.69
Being successful in a business of my own	3.44	0.78	3.66	0.47	0.56
* Significant at .05 level of significance					
** Significant at .01 level of significance					

TABLE 3  
Mean and Standard Deviation of Satisfied and Dissatisfied Male Youth on  
Life Goals Inventory

Items	Mean	SD	Mean	SD	t
Becoming happy and content	3.42	0.49	3.85	0.34	0.63
Becoming well-off financially	3.57	0.49	2.71	0.69	2.52*
Inventing or developing a useful device	1.92	0.79	1.57	0.72	0.67
Helping others who are in difficulty	2.85	0.83	3.00	1.06	0.24
Becoming accomplished in the performing arts	2.42	1.11	2.00	0.92	0.58
Developing a meaningful philosophy of life	2.71	0.95	2.51	1.03	0.18
Becoming an authority on a special subject of my field	2.85	0.83	2.71	0.88	0.21
Doing something which will make my parents proud of me	3.42	0.72	2.71	1.16	5.22**
Making sacrifices for the sake of the happiness of others	2.70	0.93	2.16	0.68	1.37
Becoming an outstanding athlete	1.50	0.62	1.85	0.63	2.94
Becoming a community leader	1.35	0.61	1.42	0.72	0.41
Becoming influential in public affairs	2.50	1.11	1.28	0.42	1.90
Following a formal religious code	2.00	0.92	1.42	0.82	0.52

Having the time and means to relax and enjoy life	3.35	0.21	3.14	0.61	1.08
Making a theoretical contribution to science	1.50	0.62	2.14	1.12	1.16
Making a technical contribution to science	1.05	0.31	2.42	1.29	0.80
Writing a good fiction	1.78	0.59	1.71	0.88	0.01
Being well-read	2.85	0.91	2.28	1.03	0.57
Becoming a mature and well-adjusted person	3.42	0.49	2.57	0.72	2.19
Obtaining awards or recognition	3.00	0.25	2.14	0.34	1.97
Never being obligated to people	3.00	0.84	1.71	0.69	2.40
Keeping in good physical condition	3.50	0.62	3.14	0.63	0.85
Producing good artistic work	2.00	1.13	2.14	0.83	0.19
Becoming an accomplished musician	1.92	1.09	1.85	1.12	0.09
Becoming an expert in finance and commerce	2.21	1.07	1.81	0.75	1.18
Keeping up-to-date with political affairs	2.78	0.93	1.42	0.72	2.32
Being well-liked	3.64	0.47	2.14	0.83	3.63
Being a good husband or wife	3.42	0.62	3.00	1.06	0.79
Being a good parent	3.64	0.47	2.57	0.90	2.53
Finding a real purpose in life	3.50	0.82	3.00	1.06	0.81
Being active in religious affairs	1.78	0.99	1.85	0.98	0.85
Having executive responsibility for the work of others	2.42	0.82	2.00	0.75	0.78
Avoiding hard work	1.14	0.34	1.71	0.88	1.49
Engaging in exciting and stimulating activities	3.07	0.59	2.85	1.11	0.40
Being successful in a business of my own	1.50	0.90	2.42	0.72	1.89
* Significant at .05 level of significance					
** Significant at .01 level of significance					

It may be noted from Table 2 that the female students who are satisfied with life differ significantly from those who are dissatisfied on 2 items of the Life Goals Inventory: "Becoming happy and content" and "Helping others who are in difficulty". Only on one statement, "Becoming an outstanding athlete", the dissatisfied females have scored significantly higher mean.

Thus, one may say that the females who are satisfied with life show preference for the traditional roles, patterns and goals allotted to them by the society.

Table 3 indicates that the males who are satisfied with life differ significantly from those who are dissatisfied on seven items: "Becoming well-off financially", "Doing something which will make my parents proud of me", "Becoming a mature and well-adjusted person", "Keeping up-to-date with political affairs", "Being well-liked", "Being a good parent". The trend of the result indicates that the satisfied males show preference for traditional values and goals, like being ambitious and being a good parent.



Further analysis was done to compare the satisfied and dissatisfied females and males on nine factors of the Life Goals Inventory. These goals were obtained by Richards (1966) after factor analysing the intercorrelations of 35 items of the Inventory. The factors obtained are:

1. *Prestige Goal*: Becoming a community leader; becoming influential in community.
2. *Personal Happiness*: Being happy and content; well-adjusted; being good husband/wife.
3. *Humanistic-Cultural*: Developing a meaningful philosophy; being well-read.
4. *Religious Goal*: Making sacrifices for others; following a religious code.
5. *Scientific Goal*: Inventing a useful product; making a theoretical contribution to science.
6. *Artistic Goal*: Writing good fiction; producing good artistic work.
7. *Hedonistic Goal*: Being well-off financially; having the time and the means to enjoy.
8. *Altruistic Goal*: Helping others in difficulty (exclusively for females).
9. *Athletic Goal*: Keeping in good physical condition (exclusively for males)

Means and standard deviation and *t* values are presented in Tables 4 and 5.

Significant differences were obtained between the satisfied and dissatisfied females on three factors, namely, prestige goal, religious goal and altruistic goal. And for the males, significant difference was obtained on one life goal, namely, prestige goal. Richards (1966) observed that altruistic goals emerged for females only and athletic goals only for males during factor analysis. Therefore, no comparison can be done on these goals.

## DISCUSSION

Cultural ideology, the normative system of beliefs and values which the society has developed over a period of time, plays a significant role in evaluating differently various kinds of behaviours and roles that are assigned to persons according to age which possibly affect their satisfaction with life, aspirations, values and life goals and level of achievement in culturally significant areas of behaviour. However, such beliefs and values are experienced differently by the males and females in different cultures. Such culturally related sex role behaviours are particularly apparent in such Asian countries as India where religion, culture and traditions have significant influence on the individual's life cycle (Kakar, 1979), values, goals and psychological well-being (Mirakhur, 1991).

The social structure of Indian society visualizes different, clearly demarcated roles for men and women (Kakar, 1973; Nandy and Kakar, 1979) and, accordingly,

TABLE 4

	Prestige	Personal Happiness	Humanistic Cultural	Religious	Scientific	Artistic	Hedonistic	Altruistic	Athletic
Females (Above 6) (n = 27)									
Females (M)	16.48	18.37	10.18	6.59	5.70	9.22	8.33	9.33	7.51
SD	2.71	1.44	2.32	2.07	2.64	2.61	1.30	1.53	1.31
Females (Below 4) (n = 6)									
Females (M)	15.00	16.83	9.16	4.66	4.50	8.83	8.16	7.66	7.50
SD	3.95	4.01	3.80	0.74	1.60	2.83	2.11	0.74	1.77
t	2.77*	1.68	0.88	2.29*	1.09	0.33	0.26	2.65*	
* Significant at .05 level of significance									

TABLE 5

	Prestige	Personal Happiness	Humanistic Cultural	Religious	Scientific	Artistic	Hedonistic	Altruistic	Athletic
Males (Above 6) (n = 14)									
Females (M)	17.85	17.71	10.14	6.57	5.28	8.42	7.92	9.14	7.78
SD	2.61	1.74	2.66	1.83	1.66	2.79	1.43	1.59	1.51
Males (Below 4) (n = 7)									
Females (M)	14.28	16.14	9.14	5.42	6.71	8.28	7.57	8.71	7.57
SD	1.74	3.18	2.29	1.04	2.30	2.48	0.72	1.02	1.17
t	2.22*	1.52	0.87	1.30	1.39	0.13	0.62		0.55
* Significant at .05 level of significance									

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and mother. Most women maintain throughout life an identity based on relationships to others—a self defined by their husbands and children. Even the majority of women who work define themselves in this manner and consider their work as an instrumental activity to reach family goals, rather than as an anchor for self-definition. Thus, the life goals of satisfied females are influenced by the culture and they show preference for goals, like becoming happy and content, which is approved by the Indian society.

In this study, it has been observed that females and males satisfied with life differ, significantly, from those dissatisfied with life, on prestige goal. This may be because they want to become a community leader, become influential and enter the world dominated by technology, work ethics and professional norms. Satisfied females, in comparison to dissatisfied females are more concerned with altruism and personal comfort. They perceive the culmination of their life goals in motherhood which will be associated with social as well as financial security. Further, analysis reveals that females have considerable religious involvement (Wadley, 1988) and satisfied females conform to this practice. Women's religious practices, meanwhile, are not authorized by the religious authorities but they do provide for female solidarity and for alternative sources of religious power. Women's ritual practices, however, emphasize kinship and family relationships, reinforcing the view of woman as wife. Thus, despite the ideology of the powerful aggressive woman, females probably will continue to be motivated by the Hindu conception of the woman as dutiful wife, and will perform their yearly rituals for their husbands, long life, the presence of many sons, and so forth.

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### *Effectiveness of Concept Attainment Strategies: A Review of Research*

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A CONCEPT is assumed to be a set of specific objects, symbols or events which share common characteristics and can be referenced by a particular name or symbol. Concept learning is thus regarded as the identification of concept of attributes which can be generalized to newly encountered examples and discrimi-

nate examples from non-examples (Tennyson and Park, 1980). Concept can be thought of as information about objects, events and processes that allows us to differentiate various things or classes to know relationship between objects, and generalize about events, things and processes (Klausmeier, 1977). All concepts possess at least four components: attributes, examples, definition and hierarchical relations. These components help the teacher in facilitating concept attainment.

## STRATEGIES OF CONCEPT ATTAINMENT

The elements of concept, particularly its attributes and examples, play important roles in students' thought process directed to concept attainment. Bruner, Goodnow and Austin identified regularities in students' decision-making processes that they labeled thinking strategies. Their research has implications for developing concept attainment teaching strategies, for understanding students' responses during concept attainment activities.

In their work on concept attainment, Bruner and his associates uncovered six distinct thinking strategies used to attain concepts and five sets of factors that affect selection of these strategies. These factors are: (i) Definition of task, (ii) Nature of the instances encountered, (iii) Nature of validation, (iv) Anticipating consequences of categorizing, and (v) Nature of imposed restrictions.

The six concept attainment strategies are divided into selection and reception strategies based upon learning conditions.

### *Selection Strategies*

Selection strategies are used when the learner is free to choose concept instances (examples and non-examples) in order to test hypothesis about concepts. In terms of instructions, this means that with these strategies the teacher presents unlabeled examples of the concepts and the students inquire as to which of the presentations are examples and non-examples and attempt to construct positive examples on their own.

### *Reception Strategies*

With these strategies, the learner's major area of freedom is in the hypotheses he chooses to adopt, not in the manner in which he can choose instances to test. The teacher presents examples of the concept that are labeled yes or no. Reception strategies are most often required for concept attainment—both within the classrooms and in everyday learning opportunities.

## AN OVERVIEW

The authors overviewed the research studies at the different levels as under.

1. Before adopting any model of teaching one should first know the understanding level and reaction toward the strategies of concept attainment. Passi, Singh and Sansanwal (1985), Bihari (1986) and Das (1986) found the significant favourable change among student-teachers towards the understanding of, and reaction towards, the theoretical aspect of the concept attainment strategies.
2. The research studies experimented abroad and in India on the concept attainment strategies have concerned themselves with the classes first to graduate level, student-teachers and teachers with no previous experiences with the subjects of social studies, mathematics, science and educational psychology.
3. The concept attainment strategies are more effective over the traditional approach of teaching (Byers 1961, Beldon 1971, Wager 1972, Ngoi 1974, Bachman 1979, Rallins 1980, Pandey 1981, Chittriv 1983, Antimadas 1986, Gangrade 1987, Sushma 1987 and Chaudhary and Vaidya 1988). However, there was no significant effect of the concept attainment strategies over the traditional approach of teaching-learning process (Schaeffer 1971, Trundnak 1974, Bardelon 1978, Gilmore 1985, McDonald 1986, and Ponick 1986). This might be due to the different types of intellectual operations.
4. Achievement is termed as knowledge attained or skills developed in school subjects, usually designated by test scores or by marks assigned by teachers or by both. The concept attainment strategies were effective in terms of achievement (Byers 1961, Henkin 1977, Rallins 1980, Chittriv 1983). However, mean performance of the experimental and control groups on the achievement test is not significantly different from each other (Sharma 1986).
5. There are different factors which affect the level of concept attainment among the learners. The spatial scanning (Lamke 1965) mode of presentation of subject matter (Seldon 1971), ability of acquiring concept (Bordelen 1978, Chittriv 1983, and Gilmore 1985), teachers' questioning (Pandey 1981), personality factors (Antimadas 1986), manipulating visual and cognitive process (Ponick 1986), and intelligence (Gangrade 1987) had significant effect on concept attainment. However, personality factors have no significant effect on the concept attainment process.
6. There are two types of concepts, namely, conjunctive and disjunctive. Disjunctive concepts are significantly more difficult than the attainment of conjunctive concepts.

7. The concept attainment strategies are responsive to the needs of the disadvantaged learners in problem-solving situations and attainment of several concepts in the teaching-learning process (Schutz 1969, Henkin 1977).
8. Effective meaning of body of knowledge and instructional feedback are more effective for facilitating performance of the learners (Passi, Singh and Sansanwal 1985 and Bihari 1986).

A number of concept attainment strategies are experimented abroad at different levels and they are more effective in the teaching-learning process for making the learners able to attain concepts easily in their subject matter in the classroom situation. In India these strategies are new, especially Bruner's strategy of concept attainment. There is a need to experiment these strategies to make the teaching-learning process effective in Indian classrooms.

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## Book Reviews

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### Preschool Education

#### Preschool in Three Cultures

Tobin, J.J., Wu, D.Y.H., Davidson, D.H., Yale University, London, 1989,  
pp. 238, £20.

**P**RESCHOOL in Three Cultures—Japan, China and the United States—provides a fascinating and totally new dimension to the study of preschools through its ethnographic and interdisciplinary approach. The book is a joint effort of a cultural anthropologist, a preschool education expert and an expert in 'human development'. Unlike other research efforts in preschool education which aim at studying pedagogical approaches, staff patterns, curricula, etc., the book under review, with the help of 'visual ethnography', presents a study of not only preschools of three cultures but also "three cultures as seen through three preschools!" The style of the book is 'dialogic'. Using a short video film of each country's preschool as its base, it presents the perspectives, interpretations and reactions to the film of practitioners, researchers, parents both from the same country as well as from the other two countries. These reactions and discussions coupled with the authors' own deductions and interpretations provide a rare insight into the cultural and social influences and dimensions of the preschool and its role in child socialization and cultural transmission. Written in an extremely readable, introspective and engaging style, the book will certainly succeed in provoking readers interested in preschool education to literally pause—and ponder!

The introductory chapter of the book gives a frank and detailed description of the methodology of the study, including its limitations. In the three chapters that follow, the authors begin each chapter with details of the twenty minutes' video film of 'a day in preschool' in each country, i.e. Japan, China and the United States, and go on to present reactions to the film and interpretations of viewers, both from the country to which the preschool belongs as well as from the other two countries. From these discussions the reader can draw a vivid picture of the educational priorities as well as cultural attitudes and practices characteristic of each of the three countries.

The second chapter focuses on Japan. In terms of disciplinary approaches the Japanese preschool teachers and, to a lesser extent, the Japanese preschool administrators, emerge as pragmatists rather than ideologues. Their discipline and classroom management techniques tend to be eclectic focusing on 'whatever' works in a particular situation. Generally, they prefer a non-confrontational, energetic, friendly and effectively neutral approach towards children, even bordering on a liberal and indulgent attitude. The Japanese teachers think their most powerful source of influence over children is their being viewed unambivalently as benevolent figures. They, therefore, avoid interacting with children in unpleasant, stressful and emotionally complex ways.

Evidently, the Japanese teachers and the contemporary Japanese society place a great deal of value on equality and on the notion that children's success and failure have more to do with effort and character, than with raw, inborn ability. It is very intriguing that the Japanese teachers are reported to find the concept 'giftedness' hard to understand in part, because of their distaste for the notion of inborn abilities as also their suspicion that identification of children as having unequal abilities would lead inevitably to an unequal allocation of educational effort, resources and opportunity! The Japanese come across in this study as clear in their priority that while unequal abilities do exist, the role of education, particularly preprimary and primary education, is to even out rather than sort out or further accentuate these ability differences. All aspects of a Japanese preschool are, therefore, structured so as to promote development of a 'group identity' and 'group skills' in young children.

A notable aspect of the Japanese preschools is a clear distinction made between 'school' and 'home' and between 'mother' and 'teacher', unlike, perhaps, the Indian priority of maintaining continuity and consistency between the two. While the emphasis in Japan is on group skills and solidarity, they do not advocate suppressing or sacrificing the 'self' to the demands of the group. The task of a preschool in Japan is to help children find a balance between individualism and groupism and integrate these dimensions to be able to move comfortably back and forth between the worlds of home and school, family and society.

"Dong Feng: A Chinese Preschool" forms the third chapter of the book. This chapter brings into focus the cultural history, philosophy and current priorities of the Chinese as reflected in their preschool programme. The Chinese preschool education programme comes across as a highly group-oriented, regimented and structured programme with little scope for nurturance of individuality or creativity. A dominating concern in China today appears to have emerged from their 'single child family policy'—which they believe is leading to spoiling of children by overindulgent parents and grandparents. Preschools are viewed by them as a solution to this problem since they provide single children with a chance to interact with other children and with teachers trained to correct the errors of single child parents. The Chinese appear, from the discussions, to believe that the primary function of a preschool is to give children a good start academically while socializing them away from being spoiled and towards good citizenship. This is possible only through 'order' and 'regimentation' which, to the Chinese, are essential elements of preschool pedagogy and child socialization.

An aspect of the Chinese preschools that Americans and Japanese in the study found very disturbing was their 'whole care' or boarding programme. About five per cent of the Chinese preschoolers are reported to be boarding students who go home only once or occasionally twice a week! The Chinese, on the other hand, in consistency with their priorities, view their 'whole care' preschools more as 'solutions' than 'problems'!

In China the social, the collective and the group appear to be valued over the personal, the familial and the individual. The promotion of selflessness and collectivism lies at the core of the Chinese preschool's mission. The Chinese believe these values are far more easily taught in preschools than at home. With a stress on uniform group activities, it is interesting to observe how all children in a preschool even go to the bathroom together all at the same time! But, unlike in Japan, in the Chinese preschools where groupism is associated with a shared acceptance of order and responsibility, individual differences in aptitude and performance are less threatening. Interestingly, while the Japanese believed the most important reason for a society to have preschools was to give children experience of being a member of a group, the Chinese believe it is "to start children on the road towards being good citizens". The predominant features of the Chinese preschool that get highlighted in this chapter are the focus on order and control, academic emphasis, earnestness and perseverance of both teachers and children, patriotic content of the curricula and, above all, 'group ethos'. The authors attempt to explore the genesis of these priorities in the cultural and historical past of the country and also register a gradually surfacing movement towards a more liberal and progressive approach, particularly in the Chinese communities away from the mainland.

In comparison to the Japanese and Chinese preschools, the American priorities for preschool that get highlighted in the fourth chapter of the book are promotion of life, liberty and pursuit of happiness. A pronounced emphasis is evident on inculcation of right to free speech (but interestingly not right to remain silent). The stress appears to be on viewing the child as an individual, a learner with potential for growth who needs a supportive, nurturing and optimally stimulating environment. The preschool programme evidently gives plenty of opportunity to children to exercise their choice, make decisions for themselves and, above all, verbalize not only their experiences but even their feelings and emotions. It is, perhaps, this deliberate effort on the part of parents and teachers that makes the American preschoolers less inhibited and more frank and outspoken in their speech and behaviour.

While there is a definite concern for individual differences in children, there is also a felt need to help children develop skills of interpersonal relations and ability to function as members of a group. Unlike Japan, however, egalitarian concerns emerged only in discussions of admission policies, not with regard to treatment of children in preschools.

Among the three countries studied, a problem or issue unique to the United States is that of child abduction and abuse. There is apparently an obsessive concern for the safety of children which gets communicated to children also. The magnitude of the problem is evidently so great that, in a litigious society like the USA's, corresponding liability-insurance rates have rapidly risen so that smaller preschools are almost running the risk of closing down!

In the context of the American preschool, the authors provide a very indepth analysis of the governments' and society's concerns regarding the apparent break-down of the American family, the changing roles of the mother and indicates ironically, that even in a progressive society like the USA, the continuance of a school of thought that dictates that woman's primary function is to look after the children and placing them in full time child care is "unwise, selfish and irresponsible!" Due to duality of opinion, the authors feel that preschool education in the USA is not given due support so that there is little government regulation and minimal public financial backing. As a result of this, qualitywise, there exist wide variations from programme to programme.

The final chapter of the book skillfully draws out the commonalities and differences among the three countries in terms of pedagogical and educational priorities along the lines summarized above.

In conclusion, *Preschool in Three Cultures* provides very stimulating fare to its readers in a language that is easily read and easily followed! Occasionally, the book does suffer from repetitive descriptions and overlaps of content but nowhere in the book can one complain of loss or wavering of interest. The indepth analysis,

the insightful perceptions and the efforts to continuously maintain the social context on the part of the authors makes reading of this book a truly enjoyable and edifying experience.

VENITA KAUL

## Individualised versus Cooperative Learning

### **Classroom Life as Civic Education: Individual Achievement and Student Cooperation in Schools**

David C. Bricker, Columbia University, New York, 1989, pp. xxiv + 125, \$21.95.

THE book under review is the second in the Teachers College Press Series—Professional Ethics in Education, which is devoted to the examination of ethical issues in all educational settings. The monograph deals with the importance of cooperative learning set in the context of a debate between a liberal and a communitarian view of ethics. The rationale of the book was developed through two seminars that the author had with five teachers during 1981-82. It concerned itself with equality of opportunity with respect to teacher values about daily grading, giving students turns in classroom discussions, and dividing the teacher's time between students while supervising their work.

Bricker desires a greater interaction between philosophers and teachers and writes that political philosophers need to attend to the actual process of socialisation through which students learn and from how they are indirectly permitted by authorities to interact with each other as they focus on the assigned material. On the other hand, teachers need to learn how to connect their views of their own mission as profession, to the ideas that are of interest to political theorists and ethicists.

The author is concerned about the civic education that young people are being given by the hidden curriculum in the classrooms. Teachers' discourse and practice form a part of the hidden curriculum. It also forms the character of the students. A concern is shown that many teachers and others do not yet see the importance of the hidden curriculum and continue to regard studying in the classroom as no more than the means to the goal of individual academic achievement. It is suggested that organised studying in the classroom is itself a source of

message to students about how they should live together. Schooling provides civic education even when its content is not explicitly civic. A case is made about incorporating collaborative learning motivated by friendship and generosity into the curriculum.

The heart of liberalism is an emphasis on individual freedom and in a belief that all people are equal as moral subjects. In their equality they possess the same rights to life, liberty and happiness. They hold that fairness or justice is the first virtue of public life. The idea of possession is basic in a liberal conception of human being and also the principle of equal opportunity. Teachers are obliged by that right to justly distribute benefits and burdens among students despite their physical differences.

Communitarians contend that endowments belong to all subjects together as the ingredients of a collectively owned talent pool. John Rawls labels this view as democratically egalitarian view. The liberals believe that young subjects have natural endowments. Rawls calls this view as liberal egalitarian alternative to the communitarian view. Bricker calls himself as deontological liberal and holds that natural endowments belong to individual persons, not to everyone collectively. Yet, he denies that socially conditioned attributes of immature persons belong to them. Later on, the author takes the position of a restrained individualistic. Bricker opines that the communitarian conception of a person is wrong in terms of person-society relationship. It is observed that in order to appreciate the social dependency of our individuality, we need not abandon the liberal philosophy that all persons have a right to liberty and self-determination. However, individuality can be displayed by collaborating with others and by supporting institutions that make it impossible for them to consider alternative ways of living their lives.

The author has advocated the social basis of knowledge. He believes that no person can attain entirely personal, private knowledge of anything that must remain inaccessible to others. Moreover, all academic knowledge is grounded upon inhabiting a community of persons who use the same rules together. All academic courses are language courses in the sense that they all teach students how to follow linguistic rules on the basis of which mistakes can be identified. What students learn from their courses might, in principle, be shareable with others and that sharing consists of collective inhabitations of some linguistic communities. When educators plan their curricula, they are selecting the communities into which the students would be inhabited. The liberal egalitarian teachers who value autonomy must help students to learn how to recognise the social attributes of their lives for what they are. These attributes should be looked upon as objects to be evaluated by individuals.

The main motives of helping others are: to fulfill a general duty; to maximise academic achievement as a basic good; to fulfill a specific duty; and being



generous. Bricker writes that the virtue of generosity should be seen as something that people practice, because they are of an idealised character for themselves that has generosity as one of its elements. The virtues of friendship, generosity or solidarity motivate members of a community to care for one another.

The author is worried about the practice of allowing children to work alone all the time. This is corroborated by the researches of John Goodlad who found that in most classrooms, most students spend most of their time studying alone. It gives students a distorted view of what learning is. Teachers view individual academic achievement as the basic aim of teaching. Contrary to this view, researches indicate that when students collaborate on academics, they grow to like each other more and they show greater gains in their social connectedness, than when they compete against each other or work independently. Of course, one essential condition for cooperative learning is that research should provide answer about how assignments that are not inherently suitable for cooperation can consistently lead to higher achievement for all students. Finally, Bricker writes that cooperative studying should be just one of the several methods used by teachers, and students should continue to have opportunities to do some of their work independently in order that they might gain further insight into the extent and distribution of their intellectual power.

In sum, the one-line argument of the book suggests that the goods of the community and the practices that foster community may be important for the development of capacities and values that are important to liberals. It is hoped that the book will be of interest to all those who hope that children might grow into autonomous morally responsible persons, good citizens and people to whom the goods of the community are of worth. Academic and general readers will find the book interesting. It raises afresh the twin issue of individual and social aims in education in a relatively new perspective.

P.C. BANSAL

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(Contd. on cover iii)

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## Educational Journals in India—An Overview

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THE most effective media for educational and scientific communications are journals. They are variously known as periodicals, serials, magazines, transactions, proceedings, bulletins, etc. The term 'journal' is currently defined as "a type of serial in which the parts (called issues) are generally characterised by variety of contents and contributors, both within the issue and from one issue to another. With the general exception of newspapers and some other types of popular periodicals, issues are commonly designed and numbered as constituents of a notional volume, which is completed at determined intervals by the issue of a volume title-page and/or index.<sup>1</sup>

Of all the channels of communication, journals are regarded as an

important communication channel for the dissemination of information for research and are indispensable for scholars engaged in research and development and /or teaching activities. It has been estimated that about 55,000 scientific periodicals are currently being published in the world.<sup>2</sup> The number of Indian scientific periodicals has been estimated at about 2000. "Indian Science Abstracts" (ISA) run by INSDOC, until recently a monthly abstracting service (since January 1985, ISA is being published as semi-monthly), covers around 600 Indian periodicals. "Directory of Indian Scientific Periodicals" prepared by INSICC covers about 1593 Indian scientific periodicals. Similarly, "Guide to Indian Periodical Literature. Social Sciences and Humanities" is a quarterly indexing journal and it lists about 500 social science and humanities journals published in India. It is now realised that one cannot keep up with the latest developments in any area of human activity without the use of articles published in many kinds of professional and general periodicals around the world.

#### FUNCTIONS OF EDUCATIONAL JOURNALS

Three important functions of educational and scientific journals are:

1. These journals are the official, public record of knowledge and they also serve as an archival record of scientific scholarship, scrutinized and validated by experts. The papers, published in these journals provide the basic source for consolidation and compaction into textbooks, reviews, handbooks, encyclopaedias and similar other secondary packages
2. They serve as the prime medium for disseminating information. Besides the results of research and development activity, the journals convey a variety of information—historical, social, political, commercial and pedagogical—which is of interest to scholars.
3. They are a social institution that confers prestige and rewards on authors, editors, subscribers and publishers

#### VALUE OF EDUCATIONAL JOURNALS

The superiority of journal publication over other media of communication is seen by its,

- i. rapid dissemination of information
- ii. speedy printing
- iii. brevity of information
- iv. unbound format
- v. current information



Besides the delay in information is removed by the live journal, which keeps on track with the onward growth of knowledge.

#### EMERGENCE OF EDUCATIONAL JOURNALS IN THE FIRST PHASE (1780-1850)

The year 1780 may be taken as the starting point in the genesis and development of Indian periodicals because only during this period, periodical publication made its entry in India. The period from 1780 to 1850 was considered as the formative stage. In other words it was the cradle period of periodical publication in India. Whereas this form of publication had taken its full shape in the western countries during that period.

The first educational journal "Asiatick Researches" was started in 1788 by Sir William Jones, the most illustrious British orientalist. This was the maiden attempt to introduce the oriental learning to the western world. The academic value and research utility of this journal prompted other learned societies and scholarly associations to sponsor more and more of learned periodicals. The first bilingual journal "Dig-durshun" or the Indian Youth's Magazine was also published during this period. The following table illustrates the number and variety of periodicals published during the initial stage.

From Table 1 it is inferred that the earlier periodicals were published mainly from Calcutta. Of the 39 periodicals published during this period, 26 were published from Calcutta, five from Madras, two each from Bombay, Delhi and Serampore. Out of the total 39 periodicals, 22 were annuals, 14 monthlies, two quarterlies and one weekly. Though specialisation was not common in that period, one could witness journals published mainly for subjects like Indology, Religion, Medicine, Commerce, Agriculture, Astronomy, Physics and Philosophy. The starting of periodicals during this period may be attributed to the enthusiasm and missionary zeal of the individuals.

#### GROWTH OF JOURNAL PUBLICATION IN THE SECOND PHASE (1850-1900)

There was a rapid growth in the number of Indian periodicals during the post-1850 years. The environmental conditions contributing to the starting of a number of periodicals were listed as follows:

1. Establishment of schools and colleges in India to impart education according to the western system. The new system of education introduced several subjects particularly sciences, engineering, medicine, law, etc.

TABLE 1  
Publication of Journals During the First Phase (1780-1800)

Subject	No. of Periodicals Published	Periodicity				Place of Publication					
		Annual	Quarterly	Monthly	Weekly	Calcutta	Trivandrum	Bombay	Madras	Delhi	Mirzapore
Indology and Orientalia	11	5	-	5	1	6	-	1	2	-	1
History and Archaeology	3	2	-	1	-	2	-	-	-	1	-
Religion	6	2	-	4	-	3	-	1	1	-	1
General Science	3	1	-	2	-	2	-	-	1	-	-
Agriculture	3	2	-	1	-	2	-	-	1	-	-
Astronomy	2	2	-	-	-	1	1	-	-	-	-
Medical Sciences	5	2	2	1	-	4	-	-	1	-	-
Physics	1	1	-	-	-	1	-	-	-	-	-
Commerce	3	3	-	-	-	3	-	-	-	-	-
Philosophy	1	1	-	-	-	1	-	-	-	-	-
Geography	1	1	-	-	-	1	-	-	-	-	-
TOTAL	39	22	2	14	1	26	1	2	5	1	2

Source: Computed from the list given in the document "Research Periodicals of Colonial India" by R.P. Kumar

of foreign scholars and their investigation into the philosophy, religion, and anthropology of India. The influence of Christian missions and their preachings. They spread their own religion and condemned the native religions which provoked the educated Hindus to rediscover the value of the Hindu religious system.

Science and commerce were also being set up and run on western lines and the import and export business came into vogue. New industries were also being set up, and there was a great need for giving and getting current information. The factors created the requisite atmosphere and the desire for knowledge and this could best be obtained through periodicals.

Without the three infrastructures, the periodicals would neither be produced, nor could they have reached their users. They

scale expansion of Indian Railways.

services.

3 industry.

In addition to the above-mentioned factors and infrastructures, there was a rise in the publication of periodicals in India after 1850. The following table shows the strength of periodical publications on various subjects during 1850-1900.

In Table 2 it is inferred that during 1850-1900, importance was given to social science periodical publications than the science periodical publications in the subjects like Law, Indology and Philosophy, Economics and Agricultural Sciences gained importance in that period. Among the sciences, medical sciences was prominent and this could be confirmed by the larger number of journals published in that subject. About 18 journals were brought out of medical sciences alone.

In the first phase majority of the journals (50 per cent) were published from Calcutta. The next place in the journal publication was taken by the other presidencies, i.e. Madras and Bombay.

## RELEASE OF JOURNAL PUBLICATION IN THE THIRD PHASE (1900-1950)

In this period many universities were established in India and started to realise the benefits of higher education. Educational Societies and Departments of Universities were involved in bringing forth publications to meet the educational requirements of

Table 2  
Publication of Journals in the Second Phase (1850-1900)

Subject	No. of Periodicals	Irregular	Annual	Semi-annual	Quarterly	Monthly	Semi-monthly	Weekly	Quinquennial	Twice	Surat	(Warpage)	Calcutta	Lahore	Tirunelveli	Bombay	Madras	Delhi	Mysore	Serampore	Madras	Aligarh	Bombay
Economics	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Education	5	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Government and Politics	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
History and Archaeology	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Law	11	9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Anthropology	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Religion	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Philosophy	7	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3
Agricultural Science	6	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
Astronomy	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Engineering	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mathematical Science	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Indology and Orientalia	9	3	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2
Medical Sciences	18	9	1	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TOTAL	80	2	36	1	12	23	2	4	1	1	1	1	40	1	1	1	1	1	1	1	1	1	1

Source: Computed from the list given in the document "Research periodicals of colonial India" by R.P. Kumar.

university students.

With the development of pure and applied sciences, the scientists felt the need of knowing what other researches were going on at home and abroad. Thus their urge to know what other persons were doing and also to publish the results of their own research led to the rise of scientific journals in India. Table 3 shows the manifold increase of journal publication during 1900-1950.

From the table, it is understood that there was an enormous growth of educational periodicals during this phase, particularly in the field of sciences. The number of journals published in Agricultural and Medical Sciences outweighed the number of publications published in Social Sciences and Humanities. Within 50 years (1900-1950) there was a significant growth of journals in all fields of knowledge. The total number of journals published during this period reached 220.

As seen from the previous period, Calcutta ranked first in the publication of journals. About 68 journals covering different subjects were published from Calcutta. Next came other places like Bombay, Madras and Delhi.

#### PROLIFERATION OF EDUCATIONAL JOURNALS IN THE POST-INDEPENDENT INDIA

The proliferation of learned journals during the last three decades (1950-1987) may be ascribed to various reasons, as below :

1. Increase in research and development activity as a basis for national defence, space exploration, industrial and economic development.
2. Increase in the number of scientists and technologists active in research and publication.
3. Importance attached to publications as a measure of scholars' stature by the employers.
4. Increasing specialisation and compartmentalization of subjects.
5. Developments in high-speed printing technology and transport.

Because of these reasons, over the last three decades, there has been a dramatic increase in the number of learned journals. From "Guide to Indian Periodical Literature: Social Sciences and Humanities"<sup>3</sup> and "Directory of Indian Scientific Periodicals"<sup>4</sup> one could observe the growth of periodicals. It has reached about 2500 at present.



## COMPARATIVE STUDY OF THE GROWTH OF JOURNALS IN SOCIAL SCIENCES FROM 1750 TO 1986

An analysis of the journals published in Social Sciences and Humanities till date is given in Table 4.

TABLE 4					
Publication of Journals in Social Sciences and Humanities from 1750 to 1986					
Sl No	1750-1800	1800-1850	1850-1900	1900-1950	1950-1986
1. Economics			6	16	66
2. General					65
3. Anthropology			1	4	12
4. Management					16
5. English Literature					14
6. Library Science					17
7. Sociology					40
8. Education			6	16	28
9. Philosophy			7	23	28
10. Public Administration			4	5	42
11. Area Studies					15
12. Law			9	15	17
13. History and Archaeology	2	2	4	18	23
14. Psychology					12
15. Geography					10
16. Fine Arts					10
17. Community Development					12
18. Religion		6	6	9	11
19. Water Supply and Transport					6
20. Architecture					1
21. Indology	1	9	11	21	3
22. Statistics					2
23. Humanities					17
24. Commerce					15
25. Tamil Literature					4
26. Agricultural Economics					6
27. Linguistics					2
28. Military Science					3
29. Useful Arts					3
30. Wild Life					1
31. Languages					2
Total	3	17	54	127	503
Source: Guide to Indian Periodical Literature					

Table 4 reveals the exponential growth of Social Science journals from 1750 to 1986. It has risen from three to 503, expressing the demand for Social Science information in research and development. The table also indicates specialisation in the publication of journals. Formally there were journals published in a very few subjects like Economics, Education, Philosophy, Law, Public Administration and Indology. Now journals are published in nearly 31 specialised subject fields. From the table, one could observe the increase in the number and speciality of publications in Social Sciences and Humanities.

## CONCLUSION

Periodicals have been published in India for the last 200 years. During the eighteenth century, newspapers acquired the characteristics of a modern learned journal. They became numerous during the nineteenth century, and are available in almost all the fields of specialization during the twentieth century. Though one could find an increasing trend in the number of periodical publications in India, its contribution to the world literature is not significant. It is estimated that India's contribution to the total world output of literature in Science, Technology, Medicine and Agriculture cannot be more than three per cent and this includes contributions in both Indian and foreign journals.<sup>5</sup>

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## Professional Dimensions and Educational News Culture

P.N. MALHAN

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**E**DUCATIONAL journalism of the type discussed earlier has to be a new segment of socially relevant and activist journalism of tomorrow. Like development journalism, it has professionally to be a process of exploratory, expository, participatory and promotional communication, its model to be interactory, its channels to be a multi-media mix, its operation to be essentially field and research based and reporting investigatory, interpretive and, at times, depth in demeanour. Similar to advocacy and development journalism activising change.

Its gamut is reporting, commenting, writing and featuring about education at the micro and macro levels. New trends, innovations, movements and policy thrusts and their implementation are all grist to its mill. The human resource development and other educational programmes envisaged in the 20-point programme, new education policy documents and the seventh five-year plan provide a vast source material.

Education is in itself a great disseminator of information and knowledge and a change agent. Education journalism deals with reporting

news and information and projecting writings or communications about this dynamic system through various new and old news media. This media mix ranges from colour tv, radio, computer, news reels and other formats of film, video and audio cassettes, dailies and magazines to specialised educational, science, cultural, professional and campus journals. Mass communication literature like posters, leaflets and other extensively operating traditional media, seminars, annual meets of various disciplines can be other active links in this network.

### ROLE OF EDUCATIONAL JOURNALISM

Educational journalism through this multi-media, multi-lingual and multi-ethnic operation can become a faithful ally in the process of planned development of education and human resources. In its role as a promotional agent, it can sell the philosophy and programme of new educational policies and new work and productivity culture as also new dynamic concepts and programmes of continuous, extension, non-formal, vocational, professional computer-aided education.

These vibrant and stimulating areas of education—liberal, vocational, science and technology—can provide a rich crop of human interest success or biographical stories. They can also yield a crop of hard news. In its mobilising role, it can utilise its writing and reporting skills to promote scientific temper, self-entrepreneurship, fundamental values and norms of cooperative functioning and national integration as a way of life among the millions of the future leaders of India. Educational journalism can specially help to activate the new programmes like learning for all and mass literacy and thus help to bring the neglected rural and remote areas and their inhabitants within the national grid of the educational, vocational and professional system. Its contribution in the production of supplementary reading and audio-visual material for various educational and human resource development programmes can be significant.

### INVESTIGATIVE AND DEPTH REPORTING

In case of a multi-disciplinary educational journalism, lot of probing, investigative and depth reporting is involved to make stories more specific and useful, more meaningful and believable. These can be valuable reporting devices in the hands of deft writers. By probing or investigative reporting, one means situation reporting requiring a scientific or research-based approach. No writing specially has the potential

to produce a more spectacular impact—or requires more patience and imagination—than investigative reporting. Here fact is laid upon facts. No conclusions are drawn until the facts from a conclusion. To do this type of reporting, a correspondent has not only to be a clear communicator but a master detective as well. He starts with only the hint of the story and in the face of intense reluctance and even opposition of the source, carefully pieces together elusive facts through numerous interviews and a dogged search of obscure records. The central purpose is to seek out the truth. This may require the individual reporter, or a team, to prepare the report. As a result, it is often the most extensive and time-consuming kind of reporting and very often the most crucial and controversial. This may, however, be most rewarding, getting much deeper into significance and validity than mere covering an event. Investigative reporting techniques, however, vary as much the personalities of reporters engaged in this kind of efforts.

Depth reporting means probing beneath the surface of news events and leaving no stone unturned as one grubs for facts. To put it little differently, depth reporting treats a story with a kind of thoroughness detail and background which neither the fifteen-minute radio nor the twenty-minute television newscast provide. Depth reporting tells the reader not only what happened but why it happened. The essence of this story is that it deals in explanatory facts and not in explanatory opinion. It is designed to answer all the questions the intelligent, interested reader would ask. Investigative and interpretive reporting is an essential tool for this kind of news stories. "Usually there are two ingredients which make depth reporting possible. sound planning in anticipation of the news and vigorous execution while the news is fresh."

The philosophy and grammar and the highly professional orientation and inter-disciplinary base of this new brand of journalism obviously would warrant it to be a separate profession. Its multi-media and multi-disciplinary character requires, its practitioners and reporters to be a different tribe from that of the generalist pen pushers, writers of screamy and gloomy headlines, editors of teleprinter copies and press release and coffee house-based scoop hunters and news gatherers.

#### THEORY BUILDING AND READING MATERIAL

The pioneer theory builders and trainers of this brand of journalism will have to evolve an organised body of professional knowledge, tools and skills and ethical and professional norms. The apex professional

bodies will also need to compile and produce its style books, production manuals and reading and other audio-visual material. It is gratifying that the National Council of Educational Research and Training (NCERT) and the Educational Department of the Kanpur University have taken a right and timely lead in this direction.

#### BASICALLY A PUBLIC UTILITY SERVICE

Though educational journalism as one specialised branch of education will have to become financially viable as also like any other good branch of information industry, it cannot be allowed to lapse into merely a profit-seeking industry. It has to be groomed basically as a public utility service governed by professional codes of ethics and other norms of professional responsibility. Being a purposive branch of advocacy and promotional journalism, its practitioners cannot become either mindless adversaries or unquestioning allies of the establishments. Though they may disclose, expose and criticise political, social and professional ailments, delays in pace of development or distortions in educational programmes and schemes, they should not become irresponsible critics. They should act as fearless but objective commentators, able analysts and true philosophers and guides of their clients and readers.

#### NATURE AND STYLE OF WRITING

Like their counterparts in development journalism, writings and reporting in educational journalism will have to be persuasive, objective, interpretive, sharp, crisp and tight. In respect of placement and production, these writings and stories may bear all the colour and gloss of modern printing but they will not portray morbidity, willful distortions, biased reporting or depict spiteful, yellow, spying, sensational or trashy journalism. The object of educational journalism must be the seven verbs: inform, educate, motivate, socialise, extend debate and discussion, interpret, and entertain. These functions are conducive to refining and cultivating the minds of people and teaching them the new better ways of working and living. Since the broadcast media are placed in the hands of the government and are mostly film- and sponsored programme-oriented, it falls to newspapers and magazines to provide their readers with an open forum for discussing and projecting educational news, popular or not, and for presenting conflicting points of view on them.

## CONCEPT OF EDUCATIONAL NEWS

Educational journalism has to be good in substance and form. The concept of news and their gatekeeping is central to this process. In the current phase of journalism in the country, news about education is not being given a pride of place in the country's media. Only few general interest newspapers and magazines give occasionally special stories about educational activities like NCC Camps, NSS Volunteers laying a road in a village, women students running an adult education centre during their spare time, etc. Only dailies like *The Hindu* provide special educational supplements or columns and only a limited number of educational journals deal with educational issues in detail. Whatever news appears in other newspapers is about the negative side—student strikes, gheraos of principals and Vice-Chancellors, closures, dirty staff politics, paper leakages and the like. Even Doordarshan which was initially started mainly for educational purposes does not show much regard for it. Today, unfortunately, the press cameras and tv reporters also dilate only on such affairs and even in the top national seminars, they concentrate on vips rather on main actors as also on what important things they said there. This preoccupation of the news media with negative news leads to ignoring of good news. In the name of investigative reporting they are projecting cheap, spying and sensational stories, and at times do not refrain even from publishing fictitious stories.

Good newscasting is an exacting and venturesome professional activity born out of commitment to public interest and regard for professional integrity. Facts are sacred and hard core news and must be presented accurately and with a proper perspective. But for making an average reader and listener to understand the complicated issues the need is also to provide backgrounds and interpretations and furnish feedback of experts, people and groups affected. And this is what a good news media should do in development or educational journalism.

## WHO SHOULD WRITE?

Whether educationalists or teachers, scientists or technologists can write and report better or specialist journalists prove to be better reporters and communicators, is still a moot point, for in the present context, both types of communicators need to be harnessed. Investigative reporting and pictorial feature and column and human interest writings are sophisticated arts, requiring professional excellence,

aptitude and training. So are reporting interviews or field feedbacks. Illustrated features and news stories are still more challenging tasks. But whatever be the challenges and hurdles, a professionally competent and committed writer can illuminate the bare details of reporters' work with considerable newsworthy material.

#### ESSENTIALS OF GOOD REPORTING

At the centre of the news business are the reporters. It is through their reported versions the public learns the shape and meaning of what is happening. The criteria of their good reporting are: accuracy, clarity, objectivity, attribution, timeliness and readers' interest. Other attributes to determine quality work are: fairness, good taste and sound judgement. However, journalists, being human, not machines, some element of subjectivity can enter into their reporting based on personal experience, cultural background and the paper's editorial policy. For instance, the compassion for the suffering they observe, can give heart to the news, their anger at injustices and deceptions can drive them to extraordinary efforts to reveal the truth.

Although reporting and writing news are quite separate skills, a successful newsperson must become proficient in both. Both these professional activities are practical arts, built around the practitioner's skill, perception, experience and understanding. Good reporters and news writers need to have five kinds of personal attributes, they are: (i) news sense, (ii) understanding of how to report, (iii) inquisitive mind, (iv) ability to write in a simple, effective, correct, lucid and easily understandable language, and (v) understanding of news writing techniques. The role of objectivity taboos personal opinions.

This rule presumes that passing judgement on news that a reporter describes is left to the reader. Writing of news stories also requires use of techniques that help the receivers to grasp easily and fully information in the minimum space and time span possible. These obviously differ with each medium.

#### DIFFERENT NORMS FOR DIFFERENT MEDIA

Newspapers and news magazines which are the media of the eye can provide more detailed and mentally retainable news stories with accompanying background and field feedbacks. They can also furnish interpretation and follow-up developments and opinion and comment surveys. Radio and tv, because of lack of these features, cannot

provide this type of exhaustive information. Broadcasting writing and reporting about educational affairs, therefore, have to observe different professional norms and rules.

#### CRISP AND INTERESTING WRITING

The style of writing news in newspapers and magazines implies, besides clarity and objectivity, conciseness, correctness of details, using vigorous action verbs and nouns, avoidance of over-crowding, striving for tempo in sentence structure, seeking originality in phraseology, using quotations frequently and adding scenes to build a good story. Creating and maintaining interest is, therefore, equally essential to put a magnate in a writing. Using conversational style, and making the contents informative and useful are other ways of achieving the same result. At the same time, an able writer would tell his story in terms of people, as also tell them how that particular event or measure will affect them. These and many other journalistic devices can help even a non-professional editor or writer of educational journals to make these contents more saleable. Guidelines of effective writing will, however, vary in language journalism. What these may be we need to provide workshop training in these skills of writing and reporting among the non-professional running at present various magazines, including campus education journals.

Among the report writing formats followed in newspapers and magazines are either the inverted pyramid form of story organisation or a feature form. Because newspaper readers are frequently in hurry, the news writers generally resort to the first form. Here they furnish the essence of the news in the lead—the opening sentence or a paragraph or sometimes even two paragraphs—that tells the essence of the story swiftly. In this pattern the facts are presented in order of diminishing importance to permit trimming the story if the allotted space is too short.

The lead answers the fundamentals of the story: who, what, when, where, why and how of the event—the 5Ws and H which Rudyard Kipling characterised as his six faithful men. It also dates the story, mentions the source and is headed by a smart headline which not only attracts the attention by its typographical design but gives in quintessence the most essential aspect of the news.

Writers of leads who want to play in breaking news and deadline writing, do not insist on padding all the Ws or H in the same lead. By emphasising the who or the why, they help to keep the lead short and

by sharpening it they make it crisp also.

With the coming of the electronic revolution better reporting and writing have become essential. The immediacy of television caused many an editor to shake off the shackles of tradition. The general rule now is "Do it differently if you can". But you do need an idea for a story line first. That new form is the new feature approach applied to 'hard news' or 'spot news', both terms indicating events that should be reported at once.

In the news feature a reporter tells a story instead of throwing a collection of undigested facts at the reader. The lead appears generally in the second half of the story. In this format the writer deals in specifics, not generalities. The writing style is simple and unaffected. Paragraphs and sentences are short. The words are familiar and mostly limited to one or two syllables. The story is clear and coherent. No unconnected or block paragraphs jam the narration. The writer remains in the background and eschews personal opinions. As a rule, the first person singular appears only in eyewitness stories. The other most important rules governing feature writing are: (i) avoid leaving holes in a story, and (ii) make deadlines, regardless of the medium.

The feature form of writing is comparatively more interesting but it takes a specialist to carry the readers through a story about subjects like administrative policies, price hike, technology, health or science. Some narration devices and direct quotes can put a life in such a story. But writing of pictorial features on such topics requires matured penmanship.

#### WRITING HUMAN INTEREST STORIES

As stated earlier, the emerging educational journalism throws up numerous opportunities of writing human interest stories. Literary educationalists and students can do it easily, provided they realise the newspaper stories require a handle, a news peg. If one is to introduce a particular person, one should better do it in the opening paragraphs, by giving a word portrait of the subject in vivid human terms. A writer can tell the reader what the person is like through anecdotes, quotes, brief descriptive passages and other familiar devices of journalism. However, in this attempt actions should speak louder than words.

According to some authorities, one of the best methods for hitting off a character is to pile fact on fact and observation on observation to sketch a portrait of a personality. One of the fascinating types of human interest stories can be the inner story about a person. This can



be based on an examination of his or her motivation. These stories can focus on people who are driven by strong emotions- - love or hatred, friendship and animosity, hope or self-reliance. In doing a story about such people, writers must be conscious of special problems that require sensitivity in handling and have some news value. These may be about dropouts, handicapped students, alcoholic or drug addicts, success stories, or about the unfulfilled ambitions of students or teachers. But the difference in literary ventures and human interest stories in journalism is that a story about a person is useless unless names, ages, addresses and pertinent other facts are verified for accuracy with scrupulous care.

Whatever the form of writing news stories, the basic rule of clear writing styles, good language and creative translation and transliteration must be known to every educational journalist. Without them their writings can become chaotic or risky. Good writers must, therefore, draw lines to separate truth from fiction, facts from imagination, dreams from reality. In using interpretations and analyses, it can add credibility if one is to cite identifiable source and verified facts and permit readers to make up their minds. Failure to identify source in journalism can make a reporter's story suspect. Since reporting is subject to legal action, reporting must be free from the onus of libel and other legal risks. To this end, plain speaking and accuracy can be an asset and using bias, distortion, rumours, clichés, loaded words, editorialising, hunches, and staged or pseudo events can prove to be a liability.

#### RADIO WRITING

Although the newspaper reporters and the radio reporters share most of the same communication techniques and also the knowledge of what makes news, writing for the broadcast media is a different art and their scripting is done in different formats. Radio news copy is a mike copy for the listeners' ear and is generally meant for somebody else to read it aloud. It must, therefore, be clear and to the point to cut down the risk of misunderstanding. To ensure this, the radio copy must also be brief, sharp and crisp and precisely timed.

Radio copy words are not only shorter and simpler than those in the newspaper stories on the same subjects, but are written informally. They have to be more relaxed, giving the newscast a short-sleeve tone like 'especially', 'that's', 'it adds up to', etc. Even typographical devices like 'Point-13', 'five times', in 'half an hour' make for easy reading. Reading sentences aloud often provides a test of their sound that cannot be

made in any other way. In a radio copy figures are rounded off, names simplified and their pronunciations provided in easily understood phonetics. The use of slang, dialect and colloquialism are avoided. So are the symbols such as o/o, Rs, decimals, etc. Except for the roundup news programme, most broadcast news is written in present tense or present-perfect tense. Attribution and introductory phrases come at the start of a sentence or paragraph. Punctuation marks are fewer, mostly commas, dashes, marks of interrogation and exclamation and full stops.

At its best the radio news writing techniques for educational broadcast approximates superior newspaper or news magazine journalist. But when it is misapplied, the effect could be akin to reading yesterday's newspaper aloud. However much depends on who is doing the reading and what sense can be made out of the news.

#### WRITING TV NEWS

TV reporting is not the same as reporting for the print medium. In certain ways it is different from the radio copy, for here the viewer sees as well as hears on-the-shop reportage. The television medium brings to the eyes of the viewer a feeling of immediacy for an entire situation.

Basically tv newscasting is broadcasting picturised news stories, which are factual concise and precisely timed and which in one way or another has an effect upon the viewers who turn to this media for a picture of what is happening around them. Its script comprises interlacing of the visual instructions with audio commentary. For that reason the tv script is put on a split page with the narration (audio) appearing on the right side and the visual effects (video) and direction on the other. This format is intended to give appropriate directions also to unify in word and mood a jumble of sights and sounds and give them meaning. Thus those who write for television have to display the skills and insights of the play wright, the motion picture script writer and the practising journalist. This naturally represents creativity at a high level. Good "tv reportage like good drama is most effective when it appeals to reason rather than to emotion, when it strives to make its point through artistry instead of histrionics, when it uses restraint and understatement and lets mankind see at first hand the stuff of which it is made". To do this efficiently and with an economy of words and a few carefully selected scenes each night in the span of tv news network programme is no mean feat. It is a different thing that Doordarshan is yet far the mark, of professional excellence.

To be professionally successful, TV writers should have a thorough basic knowledge of the minicams (miniature cameras), videotape and Electronic News Gathering. Only then they can write a TV script and the two columns of its copy.

In TV viewing nothing is more likely to irritate a viewer than to hear extravagantly detailed descriptions of scenes that he can see clearly for himself. Instead of duplicating in words the filmed scenes, the TV writer should cue them, sometimes in incomplete sentences. "He should identify people and explain action; allowing both people and action speak for themselves."

In case of TV writing the meaning or significance of the story should be given in the first sentence. Then in the second sentence the viewers may be provided with other basic facts.

The reporter who is accustomed to writing news stories is sometimes uneasy when he is required to talk them. Yet the increasing use of remote broadcasting facilities and the increasing number of international and other events that demand remote coverage, call for more ad-lib description of unfolding events. These are done spontaneously and in familiar words. One cannot, however, write a script for a spontaneous demonstration.

#### INTERPRETING THE NEWS

Interpreting the news is of vital consequence in educational journalism, which is multi-disciplinary in scope and contents. Basically the interpretation of the news adds the factor of judgement to what is called straight news. And this is vital on most stories about public affairs. It, however, differs from editorialization. The interpretive writer explains the news using suitable attribution to show why the explanation is valid, but stops short of making proposals on the basis of his opinion or urging action on his or her own responsibility. The editorial, on the other hand, tells the reader or listener or viewer what should or should not be done about the situation, making it clear that the opinion expressed is that of the news media.

Now for all media the rule of interpreting news is to give the news first and then at an appropriate point or place, tell what it means or what its consequences are. The journalistic modes of providing interpretation to give meaning to news include: (i) an interpretive lead, an interpretive paragraph, an analysts conclusion, a tabular summary, a fact sheet, an interpretive sidebar, question and answer interview reporting, panel discussion, dialogue reporting, opinion poll and

feedback surveys. In print media interpretation may, therefore, be written into the main story or it may be made the subject of an analysis as a separate article. In radio and tv, an interpretive statement is made during the course of a newscast or a separate commentary may follow analysts or panel of experts.

Danger in doing this, however, is plying too much opinion in the media writings and programmes when the audience is not interested. This is the basic weakness of many editorial pages as well. One should understand a qualitative difference in subtle and meaningful interpretation and opinion journalism.

### ILLUSTRATIONS AND VISUALS

Illustrations and visuals of various kinds communicate thousand words. Equipped with elements of light, colour and figures, they communicate more vividly, reinforce the impact of oral and printed words and enhance comprehension of the messages. Seeing is believing. So visuals, words, action, story and drama in a package stimulate not only better understanding of a situation or an event but evoke empathy and desired human responses.

Visual communication through graphics, spot news shots, photographs and set-up shots in the print media, through verbal pictures in radio and through colour visuals and dramatic elements in tv make communication more impactful and telling. Good headlines and cutlines, good pictures or audio imagery and good tv visuals together with sounds, music, drama and stories, endow to news presentation more meaning and sense, more reality and credibility. Pictorial and tv features are more sophisticated aspects of this communication, woven around human interest situations or environmental backgrounds. Animated films provide educational attraction to the children; graphics interpret more intelligently an otherwise dull and cold data; cartoons add sarcasm and provocative feedback; and comics provide a popular medium of rapid reading and easy comprehension.

To help cameramen take more lively pictures, the new England Press Association had offered the following guidelines, which are very apt for educational journalism:

1. Change the angle—show readers something they could not see from themselves.
2. Show incompleted action—readers will subconsciously complete the action.
3. Use props—they help to tell the story.

4. Tighten composition—avoid unnecessary space.
5. Focus on one subject.
6. Limit people—use a representation of groups.
7. Add people— to show sizes of objects and add life to photos.
8. Capture moods of people—find the peak of emotion.
9. Short action and reaction—turn the camera the other way.
10. Strive for technical excellence—know shooting conditions and use supplemental lighting equipment when needed.

When working with illustrative material in TV, the TV reporter prepares a script to be voiced over maps, still photographs, film or video recordings. This is known as Voice Over (V/O) with the reporter endeavouring to ensure that the words and pictures complement each other.

In working with tape or film the reporter first screens the footage, examines the accompanying notes, and if required, obtains additional information by telephone, by recording teleprinter and correspondents' reports and by examining reference books or official informational material. The reporter then refers to spot sheets, noting the sequence and the length of each edited scene. This information is typed on the left side of the script and the timed narration is provided on the other side.

What is required in TV scripting is that the spoken words will not exceed the length of the tape. Also that all necessary identification and interpretation are provided and that there are no redundancies. A good copy will ensure that the words do not fight the illustrations and that the script is written, in so far as possible, to match the personality and the preferred cadences of the bulletin reader. Achieving clarity, accuracy, and high viewer interest in television news is not easy, but can be perfected in due course of time. As the late Carl E. Lindstrom observed: "The news writer is an artist. In its simplest term, art is the business of selecting for effect-plus skill. The writer is the creative manipulator of the most plastic, the most resistant, the most merciful and yet the stickiest substance known to man—the written word".

#### SOCIAL RESPONSIBILITIES

Of all the branches of journalism, the one that deals with education owes greater responsibility to the community because it is dealing directly with the lives, education and careers of millions of young people and academic elite of the country. The other reason why some discipline is necessary because information and knowledge are themselves becoming power as we are heading towards the information

society and there is always the risk of its misuse.

What are the privileges and what are the restraints in this respect? Knowledge about them is vital for educational journalists.

Like other journalists, educational writers and reporters can also cover anything that is in the public interest provided they are accurate and fair, and are not forbidden by law. They can also exercise the right of fair comment on public officials and public figures as long as they make no showing of malice or invade privacy by depicting an individual in a false light through knowing or reckless untruth.

One of the social responsibilities of educational journalists is to recognise that the primary purpose of gathering and distributing news and opinion is to inform people and enable them to make judgements on the issues of the time. To this end, journalism demands of its practitioners not only industry and knowledge but also the pursuit of a standard of integrity proportion to their professional obligation.

The gateway to good reporting are truthfulness, accuracy, impartiality, fair play attribution, good taste and observance of the following assorted ethical or professional codes:

- Play it straight.
- Respect the law and the rights of privacy of people in the news.
- Represent yourself as a reporter of your media.
- Respect confidences that are freely offered.
- Try to go in the front door and do not try for short cuts.
- Your job is to cover a news or explain it. It is not your job to create a news.
- Identify the character and the authority for the news and qualify statements.
- Keep a decent distance between yourself and the best of news sources. It does not play to be too chummy with them especially those who are in a position to influence the shaping of the news.
- Avoid phonies (faked quotes or interviews), freebees (free tickets, free trips, etc) and pay-offs (gifts)—the three areas of unethical journalism.
- When in doubt consult the editor.
- Be loyal to the public interest and to your organisation. Only these considerations should influence you on assignments.
- Acknowledge error when it occurs and make suitable corrections as quickly as possible.
- Get out of office into fields, factories and farmhouses to collect vivid, truthful and on-the-spot news which is in public interest.
- Resist external and internal pressures.

Educational journalism can become one of the most vital social and communication forces in our country, as also an essential link between the learners, the trainers, the media, the community and the government. To dedicated professionalists it offers both opportunities and challenges. To such persons, nothing can match the thrill of pursuing the news, pinning it down and spreading it quickly before a mass public. To the young in particular it has three attracting magnets. colourful variety of the challenging work, opportunity to be of service, and rising prestige of the profession.

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## ESP for Educational Journalism : Dynamics of Writing

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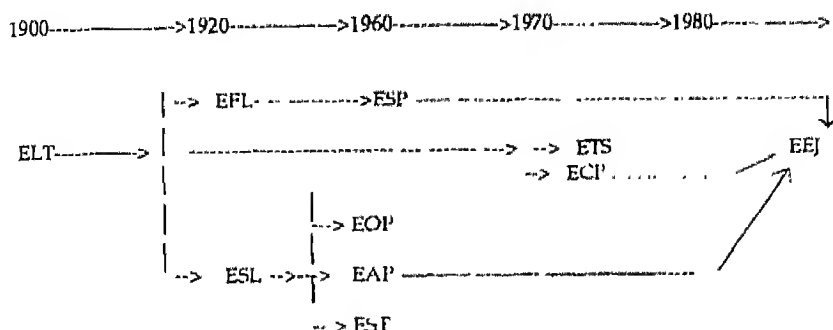
ON account of the concern-explosion and extra-consciousness in the field of language teaching, English Language Teaching (ELT) has been developing into various directions and dimensions since 1900. The studies and researches in sociology, linguistics, and psychology have given ELT sound reasons to believe that there are different Englishes for different purposes and as such to make arrangements for training the learners for such purposes. If a practitioner in science and technology is to use English for his end, he has to learn a specific English, i.e. English as a tool for social behaviour (Ets). Likewise, the writer in educational journalism is supposed to learn a specific English or use a specific English when the mode is English.

Table 1 attempts to catch how English for Educational Journalism (EEJ) may be taken to have grown along the ELT continuum since 1900. The following Explanation notes the various areas of ELT, and the



Equation analyses, briefly, the composition of EEJ.

TABLE 1  
ELT Continuum



#### Explanation

ELT=English Language Teaching  
 EFL=English as a Foreign Language  
 ESL=English as a Second Language  
 ESP=English for Specific Purposes  
 EOP=English for Occupational Purposes  
 EAP=English for Academic Purposes  
 EST=English for Science and Technology  
 ETS=English as a Tool for Social Behaviour  
 ECP=English for Communicative Purposes  
 EEJ=English for Educational Journalism

#### Equation

Writing in Educational Journalism is a tense communicative behaviour. It is a pure academic discipline. The universe of discourse is specific, referential to the writer and the reader.

$$\therefore \text{ESP} + \text{EAP} + \text{ECP} = \text{EEJ}$$

EEJ takes into account all properties and factors that are also common to other areas of educational journalism. At the same time English used in EJ accounts for some special properties and factors too. This paper tends to describe the role of properties and factors, both common and special in the dynamics of writings for EJ in English.

#### TYPES OF WRITING IN EDUCATIONAL JOURNALISM

Contents-wise, writings in EJ may be grouped into five types:

Type A. *Presentative* : submitting one's views/ideas on a particular topic /area/field.

Type B. *Reportive* . projecting information—specific account of some or one's or someone's views/ideas/work/study on a particular topic/area.

Type C. *Documentative* : providing research—specific evidences/facts/records to justify/illustrate some or one's or someone's stand/rationales/postulates/findings in a particular area/field.

Type D. *Commeutative*: appraising some or one's or someone's views/ideas/work/ study with reference to stand/ rationales/postulates/findings in a particular area/ field.

Type E. *Authoritative*: quoting authorities to illustrate/justify/establish/ support points/views/ideas on a particular topic/area/field.

Authoritative writing in *ej* is inclusive of presentative writing when the authority of the writer in the area/field is accepted universally at a given point of time. This, of course, is controversial.

However, the above categorization cannot be hard and fast. Overlapping may always be there. One piece of writing in *ej* may be partially or totally comprehensive.

#### THE UNIVERSE

Any form of written communication is writer-reader specific. Writing in *ej* is specific in the sense that it concerns formally-schooled writers and readers in particular fields of education. The writer is intending and the reader willing. For, it is neither writing off leisure nor reading for pleasure. The writer in *ej* has to own the accountability for what he writes. The reader has to own the responsibility of keeping up the acumen required for *ej*. Thus the universe of discourse is tensely charged with a matter-of-fact academic motivation on both ends.

#### THE-MODE

Owing to the above, English in *ej* presupposes an educated variety of English. The language is to be formal and structured. The presentation must be unambiguous and explicit based on relevant information, rational observation, and appropriate comments.

#### EXPLICITNESS

A writer in *ej* has to write within the orthographic system that does not give him the advantage of the speaker to a listener. It is a matter of distance communication. In order to make an expression explicit he has to use typical constructions.

For example: John didn't do it (spoken with a intonation nucleus on John)

or

It was not in fact John that did it (Written).

#### REGISTER

A particular set of lexical items is to be used in EEJ. The writer has to be very conscious about it. This is for the simple reason that thread in engineering is not the same as thread in needlework, and all the rest of the like.

For example: (a) With reference to the word 'clarity' the words used are:

in <i>Literary English</i>	in <i>EEJ</i>
clear, definite, transparent, perspicuous, unmistakable, discernible, glaring, etc.	distinct, explicit, unambiguous, evident, perceptible, manifest, observable, etc.

(b) With reference to the word 'academic', the words used are.

<i>Nonformal in English</i>	in <i>EEJ</i>
bookish, collegiate, learned, literary, speculative, theoretical, etc.	formal, scholarly, scholastic, speculative, theoretical, etc.

(c) *learned comments* or *speculative comments*

Choosing the right word for use is the precondition for EEJ because of the technical variety it demands.

For example:

(a) For *appraisal* which of the given verbs is to be used?  
to compare, to conclude, to contrast, to criticize, to justify, to interpret, etc.

(b) For knowing which of the given verbs is to be used?  
to define, to identify, to label, to list, to match, to name, to outline, to state, to select, etc.

#### *Grammatical Correlates*

Due to the educated variety of English sentence structures in EEJ are typically formed. Imperatives are avoided. The passive is frequently used. Clauses are nominalized.

For example: We can understand the principles if we analyse the text.

or

The principles can be understood by analysing the text.

## COLLOCATION

The mode in E<sub>J</sub> is always logical, argumentative, and analytic. The presentation of contents reads convincing, if the mode complies with collocation.

Collocation means combination of words in a way characteristic of language. A writer in E<sub>J</sub> must acquire and acquaint himself with English collocation.

For example:

- (a) *Concerned* educationists or educationists *concerned*, *weak* postulates or *feeble* postulates; characterised by axioms or characterised by *truism*; *obvious* variables or *observable* variables; *prejudiced* notion or *biased* notion or *preconceived* notion.
- (b) an *effective* method of teaching arithmetic or an *illustrative* procedure for teaching science or a *workable* system of teaching English.

## Linkers

The conjuncts used in clause and sentence connection are mostly adverbs and prepositional phrases. Using these in exact situations maintains the logical integrity of writing. Otherwise the presentation becomes either loose or abrupt. A list of linkers frequently used in E<sub>J</sub> is given in the following table.

TABLE 2 Common Linkers in E <sub>J</sub>	
Class	Words and Phrases
Enumerative	first(ly), secondly, thirdly, one two, three, next; finally; lastly; to begin with; to start with; to conclude
Reinforcing	again, further, moreover; in addition (to), to top it, to cap it(all); with a view to.
Equate	correspondingly; likewise; in the same way; by the same token.
Transitional	Incidentally; by the way; by the by (e); by way of.
Summative	therefore; thus; in all; in conclusion; in sum; to conclude, to sum up; to summarise.

<i>Class</i>	<i>Words and Phrases</i>
Apposition	namely; in other words, for example, for instance, that is, that is to say
Result	accordingly, consequently, hence; so, therefore; as a consequence, in consequences, as a result, owing to
Inferential	otherwise, then, in other words, in that case
Reformulatory	rather, in other words
Replacive	rather, again, alternatively better, on the other hand
Concessive	besides, however, nevertheless, nonetheless; notwithstanding, still, though; yet, in any case, in spite of, after all; at the same time, on the other hand, all the same
Temporal transition	meantime, meanwhile; in the mean time, in the mean while
Antithetic	contrarywise, contrastingly, conversely, instead; oppositely; by way of comparison, on the contrary, in contrast, by contrast, by way of contrast, in comparison with; by comparison, on the other hand.

Linking devices, in case of paragraph connection, are mostly noun phrases in addition to the conjuncts given above. These are to be taken care of. For, the relevant continuity, argumentative sequence, and logical coherence within a written work depends on how paragraphs are linked with one another. The devices must be used in such a way that a following paragraph looks like an unreplaceable unavoidable natural growth of the preceding one.

### *Paragraphing*

Decimoling/numbering, indenting a sentence on a new line, leaving larger space between lines are the usual markers of a paragraph. But a paragraph is not merely a grammatical feature of writing. A sentence means if words are collocated. Likewise, a paper in 1) means if paragraphs are written in the right place.

Usually one paragraph should delineate one discussion-item or present one thought-unit. Instead of trying out or seeking for an ideal sign of paragraph it is better for the writer to group these sentences, in a paragraph, that can be seen as a set of closely related sentences.

The sentences grouped within one particular paragraph should have the impact of a wholeness in relation to those within other particular paragraphs. Hence the writer must mind intralinks and interlinks—that sentences in a paragraph and paragraphs in a paper are relatively logical and proportionately hierarchical in terms of both contents and concepts.

### *Punctuation*

Punctuation marks in written English act as prosodic feature like stress, rhythm, pitch, intonation, pause, and tempo do in spoken English.

Writers in  $\mathbb{I}$  tend to communicate special message. They must take utmost care in using the prosodic notations of written English, i.e. punctuation marks, for two reasons: first, these are not adequately capable of providing cues to the reader to understand what the writer wants to say; second, these are to be used according to fairly strict conventions.

For example:

One cannot make any comments on this. (spoken)

(=One can make no comments at all.)

or

One cannot make any comments on this. (spoken)

(=One can make only certain comments.)

or

One cannot make comments, whatever he likes to, on this. (written)

One can make comments on this: not any, but certain ones. (written)

### *Tools*


Every trade has go to use certain tools that facilitate the dynamics of the work concerned. This section deals with the tools that are most essential for  $\mathbb{I}$ .

### *The Format*

The format refers to the arrangements or the procedures of arrangement of the contents in terms of chapters, subchapters, sections, sub-sections, and so on. A paper in  $\mathbb{I}$  reads clear if such a layout is indexed in the beginning. This keeps the reader aware of the writer's intents. It is, in fact, a physical guide for his mental mapping.

*Models*

Loud thinking can be represented best through models. A model drawn properly may substitute lots of explanations and discussions. The reader-perception becomes much easier and more accurate.

For example: → for movement;  for circulation.

Models help the reader visualize and identify the abstractions the writer conceives of in his writing.

For example . teaching models.

*Diagrams*

A diagram is a visual design or plan to illustrate or explain something. Diagrams are sketches that represent features/properties/processes/principles/systems of something the writer wants to expose/establish/suggest, e.g. a diagram of a school plant complex.

*Paradigms*

A paradigm suggests a pattern that, according to the writer, operates within a process or functions within a system e.g. the conjugation of a verb.

For a writer, in EJ, paradigms are as useful, productive, and communicating as models and diagrams are.

*Tables*

A table is a systematic or orderly arrangement of facts/information that the writer wants to present with reference to the contents. Tables are usually in columns.

For example: a table showing the forms of the s genitive.

Tables are not only auxiliary but also modal: these make the facts/information observable and meaningful and thus earn the writer strength to have correct impact on the reader.

*Figures*

A figures is an illustrative drawing that represents the data the writer intends to cite, in a collected, comprehensive manner. In EJ figures usually comprise numerical or statistical facts/information. In research-oriented papers these are indispensable if numerical or statistical interpretation/citation /justification is required thereby. Hence figures are not necessarily numerical or statistical.

For example' a figure showing the parts played by *conjuncts* in clause and sentence connection.

### *A Word of Caution*

In E<sub>J</sub> it is imperative that the models, diagrams, paradigms, tables, and figures are explained in clear, unambiguous, mathematical language. No artistry is to be indulged in. Otherwise there may be chances that the paper is partially understood or misunderstood or not understood at all or not understood the way the writer wants the reader to.

### *\*Appendices*

These are auxiliary materials/information/illustrations/data, given at the end of a paper, that the writer thinks necessary to supply the reader with.

For example: a comparable table of raw scores obtained from a pretest and a post-test in English language in Class X in a school

In order to keep the contents-flow linear and constant the appendices are referred to as branching frames are in programmed instruction. In E<sub>J</sub>, of course, the option to consult these remains with the reader. Nevertheless the writer has to be very judicious as to which materials/ information /illustrations/data must or must not get room in the main body of the contents and as such should or should not be placed in the appendices.

### *Definition of Terms and Concepts*

In many a case a writer in E<sub>J</sub> uses terms and concepts in such connotations and dimensions as may be unconventional in the topic/area/field or unusual for the reader, but referential to the contents concerned.

For example. *concept* (in a context) = a child's notion of the *tool use of facts*

A writer has reasons to do this. But, by all means, these are to be defined in simple, unambiguous, mathematical language by the writer. It is his responsibility. For, the specific terms and concepts used, are the basic understand-units by which the academic worth of the contents are weighed or accounted for. As such, perhaps, it is better if the definition of terms and concepts is tagged before the main body of the contents begins



## REFERENCING

Quoting authorities/ materials in the body of the text plays a vital role in 1) A writer should be away with the myth that too many quotes make a paper scholarly. Profuse, sporadic, callous bulk does not prove scholarship. It really depends on the assimilation of read/consulted/collected materials. A writer in 1) must be very choosy and selective about quoting.

Referencing bear a great responsibility too: first, materials must be quoted in their exactness, and second, these must not be quoted in clear tricky way so as to serve the end of the writer

Long references often are repulsive to the reader. These may be indented or had better be placed in appendices. Each and every quoting must be listed in order in detail, at the end. A writer is free to follow any standard system of referencing; but there must be uniformity all through

## ABSTRACT

An abstract is just the opposite to what a microscope does to a small thing. It is a macro write-up of the paper. The assumption is that the paper would be a detailed amplification/magnification of the abstract that welcomes the reader to the particular discussion/discourse concerned.

To talk about the big in small is the most difficult behaviour in spaking. To do so in writing is still the most difficult language behaviour. The expertise in abstract-writing depends on the writer's prolonged, arduous practice to develop this competence. An abstract has to be representative and comprehensive, especially in cases where it is read separately.

For example: an abstract in a collection of abstracts.

## EDITING

Editing is always implied in writing. In EEJ editing has got a special role. Before the written material is ready for submission it is imperative to get it edited either by the writer or by an edit-expert. The editor is a defferent personality because the writer may not have the strict academic objectivity and detatchment as regards his own thoughtlings. If the writer and the editor are the same person, it is advisable to have a considerable time-gap between writing and editing

A core checklist for editing is given in Table 3

TABLE 3 Core Checklist for Editing	
F O R M A T  E D I T	<ol style="list-style-type: none"> <li>1. layout</li> <li>2. numbering/ decimaling sections/ sections</li> <li>3. heading and subheading</li> <li>4. indention</li> <li>5. placement of paragraphs/models diagrams/tables, etc</li> <li>6. indexing contents</li> <li>7. listing references/bibliography</li> <li>8. tagging appendices</li> <li>9. pagination</li> <li>10. uniformity</li> </ol>
L A N G U A G E  E D I T	<ol style="list-style-type: none"> <li>1. grammar</li> <li>2. spelling</li> <li>3. punctuation</li> <li>4. collocation</li> <li>5. registers</li> <li>6. linking devices</li> <li>7. beginning /concluding lines</li> <li>8. idiom/phraseology</li> <li>9. expression</li> <li>10. sentence framing</li> <li>11. paragraphing</li> <li>12. paragraph framing</li> <li>13. grammatical correlates</li> </ol>
C O N T E N T	<ol style="list-style-type: none"> <li>1. explanation of illustrations/models/diagrams, etc</li> <li>2. definition of terms and concepts</li> <li>3. indexing and pagination</li> <li>4. referencing—in the body and at the end</li> <li>5. tagging appendices</li> </ol>
C E O D I N G C T  E P T	<ol style="list-style-type: none"> <li>1. clarity</li> <li>2. explicitness</li> <li>3. unambiguity</li> <li>4. precision</li> <li>5. relevance</li> <li>6. information-validity</li> <li>7. discourse-credibility</li> <li>8. idea-reliability</li> </ol>

## CONCLUSION

We have so far tried to put together the basic properties and factors that keep up the dynamics of EIJ. It has included properties and factors that are common to IJ, in general, too.

It is obvious that the foregoing discussion has got shortcomings and limitations. It is hoped that under the guidance of IJ experts and opinions these will be overcome and improved upon.

However, the main intention of the paper is to suggest that:

- i. the language in EIJ should be ENCTHETICAL (English +Mathematics, i.e. English that has mathematical accuracy and explicitness in expressing views and ideas), and
- ii. the material in IJ should be MATIISH (Mathematics+English, i.e. English that has mathematical clarity and unambiguity in presenting the contents and concepts.

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## Education in Marathwada Region Newspapers—A Review

(Dr) V.L. DIJARURKAR

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EDUCATIONAL Journalism has become a matter of keen interest in the language press of India since its inception. Especially, Indian press in its early phase (1818 to 1880) was highly dominated by the ideals of social performance propogated by Raja Ram Mohan Roy<sup>1</sup>. It is a very interesting phenomenon that right from Raja Ram Mohan Roy and Lokmaniya Tilak, to Mahatma Gandhi, most of the stalwart Indian journalists treated journalism as a tool of mass education and social change<sup>2</sup>. However, this can be rightly focused by their contribution to the cause of education, through their newspaper writings. Further, this can be testified to the fact that Raja Ram Mohan Roy was responsible for development of Indian educational thought in origin.

He was a major guiding force for the rise and growth of Indian language press<sup>3</sup> in the nineteenth Century Lokmaniya Bal Gangadhar Tilak, the founder editor of *Kesari* (1881) has his own national perspective regarding national education.

Tilak has contributed more than 30 editorials on education. His noble cause was to cater to the interest of the nation through education. Tilak can be rightly credited for the foundation of educational journalism in language press<sup>4</sup>. Mahatma Gandhi was a pioneer who had moral and ethical values of education at the base. Young India and Harijan, his two periodicals, had a clear educative goal and Gandhiji placed his educational thought in these columns. Gandhiji believed that literacy itself is no education. According to his ideals, best of all knowledge must be for the building of character<sup>5</sup>. On the basis of these ideals, it is clear that Indian language journalism is directly related to moral and ethical values of character-building.

#### PERSPECTIVES AND DIMENSIONS

Educational journalism is a growing trend in the language newspapers of India in the post-Independence period. The news and features of the educational world are rapidly growing in many more columns in newspapers and magazines than ever before in Indian newspapers. According to a recent content analysis made by the Indian Institute of Management, Bangalore, it has been proved that educational coverage in Indian newspapers is not more than 1.02 per cent<sup>6</sup>. On this basis Prof N.S. Ramaswamy has pointed out that a survey of the various professions including the mass media would reveal that their social relevance is not high<sup>7</sup>. Educational journalism is not an exception to this.

#### CASE STUDY

How to increase educational news coverage and how to enlighten masses for carving out excellence in education is a serious problem in the Indian language press. Educational journalism is an essential part of development journalism, in a country like India<sup>8</sup>. Continuing the legacy of the last century, the Indian language newspapers are playing a significant role in reshaping educational journalism. In this paper a case study of the language press in the Marathiwada region is made to solve various problems in this field.

#### METHODOLOGY

The fundamental questions to ask about all research techniques are

those dealing with precision, reliability and relevance of the data and their analysis<sup>9</sup>. Especially when a case study of newspaper media is made, there is no other means than content analysis to analyse the phenomenon.

It has been pointed out that when qualitative coding is applied to the content of various communication media such as newspapers, magazines, or radio programmes, it is called content analysis<sup>10</sup>. Further, it has been noted that exploration studies merely lead to insights or hypotheses<sup>11</sup>. Selecting and testing of cases are significant in this background. Further, the results drawn on the basis of content analysis can be tested through experimental studies. It has been well argued that an experience survey as well as a good source of hypotheses can provide information about the practical possibilities for doing different types of research<sup>12</sup>. Thus both content analysis and experience survey methods have been adopted in this paper. Both these methods help a great deal in drawing correct findings.

#### PRESS IN MARATHWADA

Marathwada is a backward region which has no other way than education, for socio-economic change. Hence whether it is the issue of renaming of a university or the issue of private B.Ed. colleges, Marathwada people are more sensitive on education. A careful study of the press in Marathwada reveals that education is a matter of keen interest to the masses of the region. The Marathwada region consists of seven districts: Aurangabad, Jalna, Bhir, Parbhani, Nanded, Latur and Osmanabad. The area was a former part of Nizam's princely state, which was reorganized and merged in Maharashtra State in 1960. Marathwada has more than 131 colleges and 1,000 (1186) schools. The regional press has systematically fostered the roots of education in the minds of the masses. The press reflections on the various horizons of education, have a much more significance in this dimension.

Though press in Marathwada has not completed a century, yet it has laid solid foundation in various dimensions. Education is one among those fields which have a distinct ethical value in a developing region.

In 1886 A.D. the first Urdu-Marathi weekly 'Aurangabad Samachar' was published. But real educational journalism was started by A.K. Waghmare, Editor of the Marathwada weekly on 10 February 1934. According to S.M. Garge, Waghmare was a *Lokhitwadi* of modern Marathwada, who flared the fire of awakening in the masses at large

He criticised Nizam Government's educational policy. He was in favour of national education based on the needs and aspirations of the masses<sup>13</sup>.

TABLE 1  
Press in Marathwada at a Glance

S No.	District	Daily	Mag.	Weekly	Total	Newspapers in		
						Marathi	Urdu	Hindi
1.	Aurangabad	11	5	42	58	40	15	3
2	Jalna	4	-	10	14	12	1	1
3.	Nanded	6	-	23	29	19	8	2
4.	Bhir	4	-	14	18	17	1	-
5.	Osmanabad	1	-	3	4	4	-	-
6.	Latur	4	-	5	9	9	-	-
7	Parbhani	2	-	26	28	20	8	-
					160	121	33	6

Source: Information based on Dy. Director, Information and Public Relations, M.S., Marathwada Division, Aurangabad, Dec 1982.

TABLE 2  
Content Analysis Regarding Educational Journalism  
in the Prominent Newspapers of Marathwada Region  
15-11-86 to 15-12-86

S.No.	Name of the Daily	Percentage
1.	Marathwada, Aurangabad	4.2
2.	Lokmat, Aurangabad	3.1
3.	Ajitha, Aurangabad	2.8
4.	Lokvijay, Aurangabad	2.1
5	Godateer Samachar, Nanded	1.8
6.	Prajawani, Nanded	2.9
7	Rajdharm, Latur	2.2
8.	Zunzar Neta, Bhir	1.2

Source: Personal study conducted by the author

TABLE 3  
Dole Committee Coverage, November 1986

S No.	Name of the Daily	Articles/Features	Editorials
1.	Marathwada	4	3
2.	Lokmat	2	2
3	Maharashtra Times	3	2

Source: Author's content analysis.

There are two phases of educational journalism in Marathwada. Dominated by A.K. Waghmare's 'Marathwada' (1834 to 1948), the first phase witnessed early socio-cultural upheavals brought about by the press. The material was based on education-related problems of poverty, lack of resources and insight. The second phase was inaugurated by the socio-cultural awakening after the state's reorganisation. The first daily of the region named 'Ajitha' had news items regarding education. The paper dominated the scene up to 1967. In the second phase 'Marathwada' became a daily and it also projected educational problems up to 1982. In 1982, another daily 'Lokmat' arrived at Aurangabad. The race among the three continued in Aurangabad and educational journalism flourished in the region. The press in the second phase penetrated Bhir, Nanded, and Parbhani districts of the region.

#### FIELDS OF COVERAGE

In spite of the growth of mass media and specializations of news coverage, it has been noted that coverage of education to-day is a challenge to all news media<sup>14</sup>. There is greater room for progress in one reporting of education news than in many other specialities. There is a need of well-trained and well-equipped young journalists to cover educational problems. It has been pointed out that many an educational writer has tried to devise some better methods for daily coverage of higher education, but not many have succeeded<sup>15</sup>. In the Marathwada region the daily 'Marathwada' has remained successful in this respect. 'Lokmat' is also rushing to compete. But rural newspapers have yet so many problems in the coverage of education. It has been rightly pointed out that an editor who assign just any reporter to cover education



does dis-service to the newspaper and the community<sup>16</sup>. Knowing of the educational system, administration and key persons in the fields is most essential for educational coverage<sup>17</sup>. The educational reporter must be well aware of the educational facts<sup>18</sup>. Julius Harris has classified educational news as follows:

1. Scheduled dates—opening and closing of holidays.
2. Enrolment—statistics, comparison and trends.
3. Honours—citation of students and faculty.
4. Changes in Curricula—Course added and dropped.
5. Commencements—speakers, meetings and lectures for graduation students.
6. Personnel changes—appointments, resignations, and retirements.
7. Board meetings—policies, budgets, etc.
8. Activities of affiliated organisations—educational associations meets, parent-teacher's chapters.

Though the above classification holds true, following are trends in reporting in regional newspapers:

1. *Educational Policy*: Ever since the introduction of the new educational policy, educational coverage in the region has been growing. 'Marathwada' had published 25, 'Lokmat' 15 and 'Ajintha' 8 articles after the policy paper was thrown open for discussion<sup>19</sup>. The feedback to the editorials on education is also on the increase.

2. *Educational Programmes*: School and college educational programmes are regularly published in newspapers. The trend at present is that these news items are self-written by the institutes. On the contrary, the press must take interest in these issues. Good programmes, if they are not reported, may not get proper recognition<sup>20</sup>.

3. *Educational Achievements*: Achievements of youth in examinations or participation of scholars in seminars and conferences have also become a matter of news. These items are often shallow weak and narrowly reported. They must be in depth and rich in content.

4. *Campus Coverage*: Youth column is a regular phenomenon in the regional press. 'Marathwada' runs 'Hava Collegechi' and 'Lokmat' runs 'Yuva Spandan'. Another daily 'Ajintha' also has a column devoted to youth and education. According to S. P. Pawar, these columns are just like frosted columns. They are part of social interactions<sup>21</sup>. A study reveals that there are more than 60 student reporters active in writing these columns.

5. *Educational Scandals*: Exposing educational scandals has become a regular phenomenon in the regional press. The Dole Committee appointed by

the Marathwada University to report on B.Ed. colleges, was widely focussed for criticising the big bosses in the field.

The practice of giving donations to seek admission to private Engineering and Medical colleges was also seriously criticised. Such press criticism has brought about awareness among the masses regarding such scandals and Government is seriously thinking to enact a law against such practices.

Maharashtra Times had published a news feature in the series entitled "Mantri Bole College Khule". The paper also criticised private institutions for looting the poor students and demanded judicial inquiry in the matter<sup>22</sup>. The issue has created consciousness regarding the qualitative growth of education.

6. *Examinations*: Varsity examination results also become a matter of news. The Marathwada University has ably regulated and regularised the examination results and these results are published regularly in newspapers.

#### TREATMENT

The following points can be noted as observation regarding the status of educational journalism in the regional press:

1. Educational news coverage was not a regular phenomenon, but it is a growing trend in the decade.
2. Educational journalism provides delayed reward, hence very few persons practice it seriously.
3. Youth columns are more popular in educational coverage. They reflect cultural and other extra-curricular activities.
4. In cases regarding scandals more emphasis is laid on trouble. Achievements must be equally highlighted.
5. Extreme sensitive school problems must be dealt with proper responsibility and the news must conduct a constructive dialogue with the masses.
6. Careful, impartial reporting is the need of the time.
7. Educational journalism must contribute improving the qualitative status of present day education.

#### CONCLUSION

In comparison with other regions of Maharashtra, Marathwada has witnessed a steady growth of education coverage. The press is alert, active and critical. It has always presented non-crisis educational news

and it has ably postmortemed educational scandals. Writings of Gopal Sakrikar, M.Y. Dalvi and R.L. Pandit have revealed a critical approach. The efforts of Govind Talwalkar, A.K. Bhalariao were inspiring to the younger generation. Educational news and features are becoming more creditable and accurate as the educational consciousness is growing. The role played by the press in Marathwada in involving society in the educational renaissance is worth appreciating. The press in Marathwada has created massive consciousness in favour of the qualitative growth of education. Commercial attitude has been exposed and educational problems have been properly revealed to the society.

The renewed interest in education has presented a major challenge to the media. The regional press has ably met the challenge and has turned the interest into a force to change the profile of education.

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## Science Broadcasts—A Case Study

(Dr) NILIMA HARJAL

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**W**ITH the dawn of independence the country set up the basic framework for science education in India particularly by the Scientific Policy Resolution passed by the Indian Parliament on 4 March 1958. The scientific policy resolution was both a testament of faith in science and a vision of society. Through science, the country had hoped "to secure from the acquisition and application of scientific knowledge". The whole concept precipitated through the print media in early days and later the electronic media out of which radio adopted this concept almost two decades back. The beginning of science broadcasts dates back to the early seventies when the Information and Broadcasting Ministry took the decision to set up science cells in some of the major stations of Akashwani, though science broadcasts were taken up in different special audience programmes and general programmes much before that and even now much after the establishment of science cells.

## OBJECTIVES

The All India Radio from its various science Cells has been broadcasting various science programmes meant for general public and special audience such as youth, women, children, etc. The major objectives of these programmes are:

1. To popularise science among the audience.
2. To disseminate correct and accurate information on scientific researches, inventions and discoveries which may be relevant to the listeners.
3. To create scientific temper among people by emphasising the importance of science in life and to propagate the role of science in development.

## STRUCTURE OF SCIENCE CELLS

The science cells were set up primarily in the stations situated in the State capitals, viz. New Delhi, Bombay, Bangalore, Trivandrum, Calcutta, Madras, Hyderabad, Lucknow, Jaipur, Bhopal, Kohima, Cuttack, Rajkot and Bhub. The science cells at these stations prepare and broadcast science programmes in their regional languages so that the message reaches every hook and corner of each state. The following are the names of some of the important programmes listed against each station which show the regional colour that they have:

## Ahmedabad

- (a) Vignan Nikedie (Science Snippetes)
- (b) Vignan Patrika (Science Magazine)

## Cuttack

- (a) Bigvana Prava (Science Magazine Programme)
- (b) Dainandina Bigyana (Everyday Science)

## Jaipur

- (a) Anveshan (Vigvan Patrika Karyakaram)
- (b) Vigyan Samachar (Science News)

## Calcutta

- (a) Science Talks in Bengali
- (b) For youth (programme in Bengali)

## Bombay

- (a) Viadnyanik Gappa (Scientific Chit Chat)
- (b) Vidnyan Katha (Science Fiction)

## Hyderabad

- (a) Vignana Prapancha (Science for Rural listeners)

- (b) Bharata Vignana (Developmental Talks in the Field of Science)

Bangalore

- (a) Vignana Munnade (Programme for General Audience)  
(b) Science Programme for Children in Kannad

Madras

- (a) Ariviyana Poonga (Science Magazine in Tamil)  
(b) En? Eppadi? (Question Answer Programme in Tamil)

New Delhi

<i>Name of Programme</i>	<i>Format Employed</i>
1. Vigyan Charcha	Talk--5 minutes
2. Gyan Vigyan (for children)	(a) Talk- 10 minutes (b) Science News
3. Vigyan Taranguni (Magazine)	Interview-based Feature
4. Ghar Vigyan (Rural Women)	Talk--10 minutes
5. Ghar Vigyan (Urban Women)	Talk--10 minutes
6. Vigyan Vividha (for Youth)	(a) Talk--5 minutes daily (b) Interview once a week
7. Science Today (Magazine for Youth)	(a) Talk (b) Poem (c) Feature
8. Vigyan Vibha (For Youth)	(a) Interview (b) Talks
9. Talk in English	Talk--15 minutes
10. Vigyan Prashnotri (For Youth)	Science Quiz

Besides broadcasting these programmes, there is also a consultative panel at every station with a science cell, comprising of some ad advisors from outside and some official members who advise the Science Cells in their meetings twice a year, on different topics and different formats.

An important point to be mentioned here is that at the four stations in the four metropolitan cities, besides the programmes in the languages spoken by the audience, some programmes are also broadcast in English and the programmes in English are found to be equally heard, understood and appreciated by the audience.

## METHODOLOGY

### 1. Programme Production

Every officer incharge of the science cell has a team of workers

comprising of a Programme Secretary who takes up the work of typing the contracts, maintaining the files, looking after the payments of the talkers, etc, a Production Assistant who helps in editing, dubbing and recording the programmes, Assistant Editor (science reporting) who does the script writing as well as helps the officer concerned in other programme production jobs. Besides the studio recording, many a time the officer has to accompany the out broadcast team to different scientific functions for providing coverage and also to visit the schools and villages around, which immensely helps in getting the audience participation.

For the regular programmes the officer prepares a quarterly schedule followed by a monthly layout duly approved by the authorities three months in advance. Every new schedule has to have new ideas and new approaches towards science dissemination. The talkers who are the authority on the subject are then invited to speak on the subject or participate in the discussion. A great care is taken to make the contents of the programme according to the needs and attitudes of the listeners. For example, a short talk on mercury is not to start directly with its chemical properties but to start with some interesting sayings or dialogues pertaining to that chemical to catch the attention of the listeners towards that otherwise a dull topic.

## 2. Audience Research

In the set-up of the science cells the people at the All India Radio are ever keen to know the response of the listeners about their programmes in which much of hard work goes while preparing them. For this every station has an audience research unit which, either on demand from the section concerned or on their own, periodically surveys to find out the audience response towards the programmes from time to time. A gist of the audience survey report by the audience research unit of the All India Radio, Delhi, about the programmes broadcast by the science cell of the Delhi station is given below to have an idea about the concept of audience research.

(a) *The Study and its Objectives:* The Audience Research Unit of the Delhi Station conducted a study of the audience response to its science programmes, with the following objectives:

- (i) To find out the extent of awareness of, and listening to, various science programmes.
- (ii) To develop a profile of the regular listeners of science programmes.
- (iii) To find out the utility aspects in the view of the listeners.
- (iv) To elicit opinions of the listeners on the qualitative aspects

such as formats, etc.

- (v) To invite suggestions from the listeners for the improvement of these broadcasts.

(b) *Methodology and Sample:* The sample was selected in Delhi city with the help of the National Sample Survey Organisation's maps of the urban frame.

Eight blocks covering different areas and social strata of Delhi were selected and the radio households in those blocks were completely enumerated. The sample of 600 was drawn from this frame systematically.

From each sample household a male/female adult was interviewed. Persons with school education were selected for the interviews; some of the housewives were educated below high school.

(c) *Field Work:* A structured schedule was developed with some open-end questions. This was administered to the respondents selected as above. The field work was assigned to trained part-time investigators. Their work was supervised and finally their schedules were scrutinised by the staff investigators and the Audience Research Officer. The field work was conducted during the last week of February, 1987.

(d) *Tabulation:* The filled-in schedules were got tabulated by part-time tabulators at the AR Unit, AIR, Delhi.

(e) *Report Writing:* The data were further processed and necessary calculations, cross-checks, etc. were carried out for analysis and interpretation of the findings, keeping in view the objectives of this survey.

### 3. Sample Structure

The sample consisted of 53 per cent males and 47 per cent females, age-wise 48 per cent belonged to the youngest age-group 16-30 and 14 per cent were above 46 years.

Half of the respondents were graduates and above while 36 per cent were undergraduates and only 13 per cent were below high school. It is worth mentioning here that more than 90 per cent of the households in the sample owned tv sets.

Occupation-wise, 29 per cent were in service, 27 per cent housewives and 20 per cent students.

### LISTENING TO THE SCIENCE PROGRAMMES

Delhi Station broadcasts a number of science programmes. The



Science Talk in English broadcast on 'B' Channel from 9.30 to 9.45 pm registered the highest percentage of listening, viz. 31 per cent consisting of 8 per cent regular listeners and the rest 23 per cent sometimes listeners. This listening was higher (40 per cent) among younger persons, i.e. in the age-group 16-30 years.

Another programme which registered listening as high as 30 per cent is Science Today broadcast on YUVA VANI (D Channel) from 8.35 to 9.00 pm. Among its target audience i.e. youth, listening was higher 38 (per cent).

Both these programmes are broadcast once a month. But their following is found to be higher than of other programmes. One reason is the time of broadcast when the people are available for planned / chance listening. Another reason may be that the English-knowing person generally tune to Delhi 'B' for News in English and to YUVA VANI (D Channel) for youth programmes and hence will have easy access to listening.

The findings reveal that almost all the programmes had more followers among the youngest age-group. The daily programme Vigyan Vividha registered 28 per cent listening. Among the youth (target audience) it was 36 per cent.

Gyan Vigyan (children's programme) and the programmes for rural and urban women Char Aur Vigyan were listened by about 26 per cent. The listening for these programmes was higher among the females obviously 39, 43 and 45 per cent, respectively.

Vigyan Tarangini (Science Magazine) is relatively a new programme but it had a following of 19 per cent.

The programme Vigyan Charcha for general audience broadcast thrice a week from 6.45 to 6.50 am registered 25 per cent listening. This is a very good improvement over the listening of about ten per cent recorded in the quick surveys conducted during July-November, 1986.

The Audience Research Unit in their quick surveys and this comprehensive survey distributed the scheduled of Science programme with details of Channel, Day and Time of broadcast to all the sample respondents, i.e. about 300 in the quick surveys and about 600 in this survey.

As a result of this activity, the science programmes received good publicity which might have increased awareness of, and listening to, these programmes.

The details of programme-wise listening are given below:

Per cent of Listening to Science Programmes			
Programme/Channel	Listen Regularly	Listen Sometimes	Total Listening
<b>DELHI 'A'</b>			
1. Vigyan Charcha	5.1	19.7	24.8
2. Gyan Vigyan (Children)	3.7	22.9	26.6
3. Vigyan Tarangini	3.2	16.1	19.3
4. Ghar Aur Vigyan (Rural Women)	10.5	15.6	26.1
5. Ghar Aur Vigyan (Urban Women)	9.1	17.4	26.5
<b>DELHI 'B'</b>			
6. Science Talk (in English)	8.2	22.9	31.1
<b>DELHI 'D'</b>			
7. Vigyan Vividha (Youth)	8.7	19.7	28.4
8. Vigyan Vibha (Youth)	3.2	14.7	17.9
9. Science Today (Youth)	9.2	20.6	29.8
Base: Aware respondents 218			

### *Reasons for not Listening to the Science Programmes*

The respondents were asked the reason for not listening to the science programme. The major reasons recorded were "Not interested" and "Watching tv".

It may be remembered that for all the science programmes, visual impact has a better effect.

Some of the educated respondents also opined that Radio and tv should co-ordinate the programmes and decide which ones to be broadcast on each of the media.

### *Opinions about the Contents of the Programme*

The respondents were asked to comment about the content of the programme. While 64 per cent were generally satisfied with the contents, 16 per cent were "Somewhat satisfied". Details are given below.

Opinion about the Content of the Programme		Base 218
Opinion	Percentage	
Generally satisfied	63.3	
Somewhat satisfied	16.1	
Not at all satisfied	1.5	
Not relevant	18.8*	
*Rare/Never listeners were not supposed to comment		

### *Language Used*

About two-thirds of the respondents considered the language of the science programmes as "Easy to follow" while only 14 per cent considered it as "Somewhat difficult to follow".

Details are given below:

Opinion about the Language Used		Base 218
Opinion	Percentage	
Easy to follow	66.1	
Somewhat difficult to follow	14.2	
Always difficult	0.9	
Not relevant	18.8*	
*Rare/Never listeners were not supposed to comment		

### *Format for Communicating Scientific Information*

The respondents who were aware of the science broadcasts were asked to mention the format they would prefer for the science programmes. Science quiz was preferred by 39 per cent, interview by 31 per cent and short feature/play by 27 per cent. Talks of 5 minutes and 'Newsletter' were the least preferred (by only 17 per cent respondents).

Quiz and interviews (39 per cent each) were preferred by females. Hence it is suggested that more quiz programmes may be tried out in women's programme 'Ghar Aur Vigyan'. The other formats preferred by females are short feature/play talk (10 minutes) and Newsletter.

About half of the youngest age-group also preferred the format Quiz followed by interviews (37 per cent). The other format preferred is Newsletter.

In the education group too, 60 per cent of the undergraduate gave their preference for Science Quiz.

Hence possibilities may be explored to broadcast more Quiz and interview programme

The format preferences are given below:

Preferred Formats for Science Programme		N = 218
Formats	Percentage	
Talks (5 mts)	17.0	
Talks (20 mts)	23.0	
Short play feature	27.0	
Interviews	30.7	
Quiz	39.0	
Newsletter	17.4	
Not relevant	18.8*	
*Rare/Never listeners were not supposed to comment.		

### *Utility of Science Programme*

More than half of the respondents feel that the Science programme improves their knowledge on day-to-day topics. About 42 per cent of those who are graduates and above feel that the programme informs about latest discoveries, whereas about 67 per cent of the below "High School" group considered the programme as helpful in their day-to-day work. Details are given below:

Utility of Science Programmes (Multiple respondent percentage)				
Utility Conception	Education Level			Total
	Graduate and above	Under-graduate	Below High School	
They help in our day-to-day work	27.1	47.3	66.7	37.2
They improve our knowledge on day-to-day topics	51.7	54.9	11.1	51.4
They remove wrong ideas about natural phenomena	18.6	23.1	11.1	20.2
They inform us about latest discovery	42.4	22.0	22.2	33.0
Base	118	91	9	218

#### AUDIENCE CONCEPTIONS ABOUT RADIO, SCIENCE AND DEVELOPMENT

About 44 per cent of the aware respondents opined that communication of scientific knowledge can accelerate the economic development of the nation, and 40 per cent of them said that radio can be used to propagate scientific achievements.

Conception	Percentage
1. Communication of scientific knowledge can accelerate economic development	43.6
2. Science can enrich the life of common man	32.6
3. Radio can be used to propagate scientific achievements	40.4
4. Radio can give support to scientific achievements	35.8

#### SUGGESTIONS

One of the major suggestions that come from the audience was that

a fixed time may be maintained regularly for broadcasting the science programme on each channel. Moreover, they desired adequate advance publicity of the contents of the programme and if possible, the programme details may be published in all leading newspapers.

Suggestions	No. of Persons
1. Radio should give advance information and more publicity to science programmes	8
2. Science Quiz may be introduced	8
3. Students should participate in Science programmes	4
4. Programmes should be broadcast at a fixed time (say 9.00-9.30 pm) on every day on a particular channel	4
5. Programmes should be broadcast on Sundays and evening time also, so that it may not clash with popular programmes of the TV	6

#### FEEDBACK

Besides the feedback from the Audience Research Unit of different stations to the officers concerned, there are other methods as the following:

1. Microphone publicity seeking the listeners' reactions about a particular programme at the end of the programme or during the programme.
2. Personal contact with the listeners by the officer to get their reactions.
3. A general programme of replies to the listeners' letters at every station. In short we receive hundreds of letters from the listeners about different programmes.
4. Regular columns in different newspapers commenting on the programmes by critics.

#### OVERVIEW

This is how the All India Radio takes care of fulfilling the objectives pertaining to science broadcasts and a constant effort is maintained by the science cells at different stations to bring science and scientific temper closer to the hearts of the people around. Just as science is ever-evolving, so is the attitude of the people concerned at the AIR stations in giving every time a new thrust in this area of scientific wonders.

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## Ph.D. Theses Abstracts

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### *Classroom Interaction Patterns of Teachers Teaching Hindi as a Second Language*

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LANGUAGE plays an important role in education. Every country has a large number of bilingual individuals, and a multilingual country like India abounds in examples of every shade of bilingualism within it. The diversity in Indian languages representing the composite culture of India poses a serious problem of introduction and implementation of teaching and learning of languages. The linguistic reorganization of this country encourages the acceptance of regional languages as

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the first language of elementary schooling. The Constitutional rights and privileges make provision for Hindi as a national language in school education which has been accepted in most of the non-Hindi-speaking states where it is taught as a second language.

Hindi is not only the national language, but also the official language of the union government of India—the link language between the states and the centre for all official purposes and a communicative language between the people of different states of the Indian union. Teaching of Hindi as a compulsory second language aims at proficiency only in the linguistic and cultural aspect of the language while the third aspect, i.e. literacy, is also aimed at when teaching is designed for the language as a mothertongue.

Considerable research has been conducted on the teaching and learning of languages as a first language. On principle and in practice both the techniques of teaching of second language do differ significantly from the first language. Teaching a new language is acquiring a new skill. Since Hindi is being taught as a compulsory second language by teachers of various linguistic groups through different media of instruction in different non-Hindi-speaking states, they face a certain level of difficulty and type of interference in teaching Hindi in their mother-tongue or the first language as their medium of instruction. The present study is an attempt on verbal and non-verbal interaction patterns of teachers teaching Hindi as a second language while their mothertongue was Nagames, Telugu, Kannada, Malayalam, Marathi, Gujarati, Punjabi and Hindi.

#### OBJECTIVES OF THE STUDY

The study was designed to achieve the following objectives:

- To identify verbal interaction patterns of teachers teaching Hindi as a second language.
- To identify non-verbal interaction patterns of teachers teaching Hindi as a second language.
- To develop behaviour flow patterns of Nagames, Telugu, Kannada, Malayalam, Marathi, Gujarati, Punjabi and Hindi.
- To analyse the difference among Hindi teachers of Nagames, Telugu, Kannada, Malayalam, Marathi, Gujarati, Punjabi and Hindi.
- To study the difference between regular and correspondence teachers teaching Hindi as a second language with regard to behaviour flow



## HYPOTHESES

The following hypotheses were formulated and tested:

- There are different patterns of classroom interaction of teachers teaching Hindi as a second language in their mothertongue.
- Teachers have more non-verbal interaction whose mothertongue varies with Hindi language.
- There is significant difference among the classroom behaviours of Hindi teachers having mothertongue different from regional languages.
- Behaviour flow patterns differ significantly of Hindi teachers having mothertongue different from regional languages.

The rationale of these hypotheses is the findings of some previous studies which are related to classroom verbal and non-verbal interaction and teacher effectiveness. Maheswari (1976) and Jain (1984) investigate that there is significant difference between verbal and non-verbal behaviour flow of effective and ineffective teachers. Effective teachers have more indirect behaviour in their classroom interaction.

## DESIGN OF THE STUDY

The main purpose of this study was to analyse the classroom behaviour patterns of Hindi teachers teaching 'Hindi' as a second language in different states of our country. Therefore, the normative observation survey method was used for this purpose.

## SAMPLING

The purposive random sample was taken for the present study. The population for the study was defined as student-teachers of Parangat Training Course (equivalent to B.Ed.) of Kendriya Hindi Sansthan, Ministry of Human Resource Development, Agra. The teachers teaching Hindi as a second language in different states of India, were included in the population.

The sample was analysed with regard to languages so as to understand the composition of the sample (Table 1).

TABLE 1  
Sample Structure with Regard to Related Language

Language	Regular		Correspondence		Total	
	F	%	F	%	F	%
Nagames	19	25.68	0	0.00	19	9.90
Telugu	30	40.54	0	0.00	30	15.63
Malyalam	6	8.11	19	16.10	25	13.02
Marathi	7	9.46	25	21.19	32	16.67
Kannada	-	-	15	12.71	15	7.81
Gujarati	2	2.70	3	2.54	5	2.60
Punjabi	3	4.05	7	5.93	10	5.21
Hindi	7	9.46	49	41.53	56	29.17
Total	74	100	118	100	192	100

The sample was also analysed with regard to age. The age structure, as reported in organizing the class-interval, is given in Table 2.

TABLE 2  
Sample Structure with Regard to Age

Age in Years	Regular		Correspondence		Total	
	F	%	F	%	F	%
45-48	-	-	6	5.08	6	3.13
41-44	-	-	9	7.63	9	4.69
37-40	-	-	12	10.17	12	6.25
33-36	3	4.05	24	20.34	27	14.06
29-32	12	16.22	25	21.19	37	19.27
25-28	13	17.57	28	23.73	41	21.35
21-24	26	35.64	12	10.17	38	19.79
17-20	20	27.03	2	1.69	22	11.46
Total	74	100	118	100	192	100

The sample was also observed with regard to teaching experience. The teaching experience was organized into class-intervals (Table 3).

TABLE 3  
Sample Structure with Regard to Teaching Experience

Teaching Experience in Years	Regular		Correspondence		Total	
	F	%	F	%	F	%
25-29	-	-	4	3.39	4	2.08
20-24	-	-	4	3.39	4	2.08
15-19	-	-	15	12.71	15	7.81
10-14	9	12.16	12	10.17	21	10.94
5-9	22	29.73	36	30.51	58	30.21
1-4	43	58.11	47	39.83	90	46.88
Total	74	100	118	100	192	100

#### TOOL FOR OBSERVING CLASSROOM INTERACTION

Language has two aspects of behaviour—verbal and non-verbal. Non-verbal behaviour is also as important as verbal behaviour in language teaching. Flanders has developed verbal behaviour technique. Charles M. Galloway (1960) has applied non-verbal observation. The observation instrument is Galloway adaptation of Flander's System for interaction analysis called Indirect-Direct, Encouraging-Restricting (IDER). The Galloway-French observation system of classroom interaction was used in this study.

#### DATA COLLECTION

The data were collected during practice teaching. A schedule of classroom observation with IDER in different schools is given in Table 4.

The researcher organised the data into two groups—regular group and correspondence group. The regular group had to undergo the ten months' course organized by the Kendriya Hindi Sansthan and the correspondence group the eighteen months' course through the correspondence personal contact programme.

#### DATA ANALYSIS

The classroom interactions of the selected teachers were analysed through the process of encoding and decoding by preparing Matrix

TABLE 4 A Schedule of Classroom Observation with IDER in Different Schools			
Name of School	Regular	Correspondence	Date of Observation
High School, Mysore	-	9	6-6-86 to 8-8-86
Old Fort High School, Bangalore	-	22	19-6-86 to
Corporation School, Chamarajpet, Bangalore	-	10	26-6-86
J.H.S., Vijay Nagar, Agra	12	23	20-9-86
Chandrawati High School, Agra	-	10	to
Saraswati Vidya Mandir, Agra	-	30	10-10-86
Nagari Pracharini J.H.S., Agra	35	-	10-1-87
J.H.S., Vazeer Pura, Agra	27	14	31-1-87
Total	74	118	192

table. With the help of the matrix tables behaviour ratios and behaviour components were computed. The significant difference between the regular and the correspondence course was tested by 't' test, with regard to the behaviour ratios and behaviour components. This type of analysis was attempted in the following way:

#### 1. Between Regular and Correspondence Groups

- (i) Teachers teaching Hindi, with their mothertongue as Malyalam.
- (ii) Teachers teaching Hindi, with their mothertongue as Marathi.
- (iii) Teachers teaching Hindi, with their mothertongue as Gujarati.
- (iv) Teachers teaching Hindi with their mothertongue as Punjabi.
- (v) Teachers teaching Hindi, with their mothertongue as Hindi.

#### 2. Among the Different Regional Languages

- (i) Regular course teachers teaching Hindi as a second language.

(ii) Correspondence course teachers teaching Hindi as a second language

## FINDINGS

On the basis of the foregoing discussions of the results, the following formulations were made:

### (a) *Main Findings*

Under this heading the patterns of verbal and non-verbal behaviour are summarized:

- There is significant difference between Nagames and Telugu, Nagames and Malyalam, Nagames and Marathi, Nagames and Gujarati, Nagames and Punjabi, Nagames and Hindi teachers, with regard to I/D ratio.
- There is significant difference between Nagames and Marathi, Nagames and Gujarati, Nagames and Punjabi, Nagames and Hindi teachers while there is no significant difference between Nagames and Telugu, Nagames and Malyalam teachers, with regard to S/T ratio.
- There is significant difference between Nagames and Telugu, Nagames and Malyalam, Nagames and Marathi, Nagames and Punjabi, Nagames and Gujarati. Nagames and Hindi, Telugu and Gujarati, Telugu and Punjabi, Telugu and Hindi teachers, while there is no significant difference between Telugu and Malyalam, Telugu and Marathi, Malyalam and Marathi, Malyalam and Gujarati, Malyalam and Punjabi, Malyalam and Hindi teachers, with regard to encouraging behaviour component.
- There is significant difference between Gujarati and Punjabi, Gujarati and Punjabi teachers, while there is no significant difference between Malyalam and Marathi, Malyalam and Gujarati, Gujarati and Hindi teachers. Nagames Hindi teachers use less restrictive behaviour as compared to other regional Hindi teachers, with regard to restrictive behaviour component.
- It seems that Nagames Hindi teachers have significant difference with other regional language Hindi teacher, with regard to indirect behaviour component. There is no significant difference between Malyalam and Marathi, Malyalam and Gujarati, Malyalam and Punjabi, Malyalam and Hindi teachers with regard to indirect and direct behaviour component.
- It seems that Nagames Hindi teachers have largest transitions

from lecturing-responsive to attentive-pupil response, from comforting-silence to responsive-lecturing, from attentive-pupil response to congruent-praise, from comforting-silence to involving-giving direction.

- It appears that Telugu Hindi teachers have larger transitions from responsive-lecturing to comforting-silence, from attentive-pupil response to acceptance-accepts ideas, from comforting-silence to involving-giving direction.
- It shows that Malayalee Hindi teachers have greater transitions from responsive-lecturing to comforting-silence, from attentive-pupil response to acceptance-accepts ideas, from involving-giving direction to attentive-pupil response, from personal-ask question to attentive-pupil response.
- It appears that Marathi Hindi teachers have larger transitions from responsive-lecturing to comforting-silence, from attentive-pupil response to acceptance-accept feelings, from involving-giving direction to comforting-silence, from personal-ask question to involving-giving direction.
- It seems that Gujarati Hindi teachers have higher transitions from attentive-pupil response to comforting-silence, from comforting-silence to involving-giving direction, from involving-giving direction to attentive-pupil response.
- It appears that Punjabi Hindi teachers have greater transitions from responsive-lecturing to involving-giving direction, from attentive-pupil response to involving-giving direction, from involving-giving direction to attentive-pupil response.
- It shows that Hindi Hindi teachers have largest transitions from attentive-pupil response to acceptance-accepts feelings, from responsive-lecturing to involving-giving direction, from comforting-silence to involving-giving direction, from personal-ask question to attentive-pupil response.
- It appears that Kannada Hindi teachers have higher transitions from responsive-lecturing to comforting-silence, from attentive-pupil response to comforting-silence, from elementary-using pupils' ideas to comforting-silence, from involving-giving direction to comforting-silence.

(b) *Secondary Findings*

Under this heading, patterns of verbal and non-verbal behaviour of regular and correspondence course teachers are reported:

- It seems that regular and correspondence teachers of Malayalam language differ significantly for E/R ratio, I/D ratio, i/d ratio and S/T ratio.
- Regular teachers are more encouraging and more indirect in verbal behaviour. Correspondence teachers are more restricting in non-verbal behaviour and more direct in verbal behaviour.
- Regular and correspondence teachers of Marathi language differ significantly for E/R ratio and S/T ratio. Regular teachers have high E/R ratio and S/T ratio than correspondence teachers.
- Marathi teachers of regular and correspondence courses do not differ with regard to I/D ratio and i/d ratio and indirect verbal behaviour.
- Gujarati teachers of regular course have high I/D ratio and S/T ratio than correspondence teachers. There is no significant difference between E/R ratio and i/d ratio.
- There is significant difference between regular and correspondence Gujarati teachers for direct verbal behaviour. Correspondence teachers have high direct behaviour than regular teachers. There is no difference with regard to encouragement, restrictiveness and indirectness.
- Punjabi Hindi teachers of regular course have high I/D ratio, i/d ratio, and S/T ratio than correspondence course teachers. There is no difference with regard to E/R ratio. Correspondence teachers have high restrictiveness, indirectness and directness than regular teachers.
- Hindi teachers with Hindi as their mother tongue, do not differ with regard to E/R ratio. The regular group has higher I/D ratio, i/d ratio and S/T ratio than correspondence teachers.
- Regular teachers have high encouragement and indirectness than correspondence teachers. There is no difference between regular and correspondence teachers for restrictiveness and directness.
- There is difference with regard to E/R ratio between Nagames and Malayalam, Nagames and Marathi, Nagames and Punjabi, Punjabi and Telugu, Punjabi and Malayalam, Punjabi and Marathi teachers.



*Effectiveness of Certain Curricular Activities  
in the Development of Creative Thinking  
of High School Students of Backward  
Hilly Region of Jammu*

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**T**HE main purpose of this study was to identify creative talent among high school students in the backward hilly region of Jammu and to study the effectiveness of certain curricular activities, namely, brain-storming, problem-solving, project and quiz in the development of creative thinking. The following objectives were formulated for the conduct of study:

- (i) To develop verbal and non-verbal tests of creative thinking for measuring the dimensions of fluency, flexibility, originality, elaboration and originality (non-verbal) involved in the process of creative thinking among high school students of the backward hilly region of Jammu in Jammu and Kashmir State.
- (ii) To study the effect of teaching by involving curricular activities, namely, brain-storming, problem-solving, project and quiz in comparison to the traditional method of teaching on verbal fluency, flexibility, originality and total verbal creative thinking and also on non-verbal dimensions, i.e. elaboration, originality, total non-verbal and total creative thinking of high school students.
- (iii) To compare the effect on verbal fluency, flexibility, verbal originality, verbal creative thinking, elaboration, non-verbal originality, non-verbal creative thinking and total creative thinking of the five groups of high school students: (i) one following teaching through curricular activity brain-storming; (ii) second following problem-solving; (iii) third following project activity; (iv) fourth following quiz activity; and (v) fifth following traditional method of teaching.

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### TOOLS DEVELOPED

Four verbal test activities, namely, seeing problems, unusual uses, consequences and product improvement; and five non-verbal test activities, namely, incomplete figures, squares, circles and making objects were selected for the development of tests of creative thinking. The final draft of the verbal test of creative thinking includes four test items each in seeing problems and unusual uses, three items in consequences and one item in product improvement and the final draft of the non-verbal test of creative thinking includes nine items in incomplete figures, nine each in squares and circles and eight figures in making objects activity.

The reliability of the verbal and non-verbal tests of creative thinking was determined on an independent sample of 150 students selected randomly from ten high/higher secondary schools situated in four backward hilly districts of Doda, Udhampur, Rajouri and Poonch.

### METHOD AND PROCEDURE

#### *Tools Used*

In addition to the verbal and non-verbal tests of creative thinking developed for measuring different dimensions of creative thinking by the investigator himself, the Socio-Economic Status Scale Questionnaire (SESQ) of Koul (1985) and Reven's Progressive Matrices (RPM) were also used in the study.

#### *Sampling*

A sample pool of 266 high school students of ninth grade was taken from all the four high/higher secondary schools for boys in Kishtwar Town of Doda district in the Jammu and Kashmir State. On the basis of their scores on intelligence and socio-economic status, a sample of one hundred students was finally selected for the conduct of the experiment. It was further divided into five identical groups with twenty students in each group, to be taught using either of the four curricular activities: brain-storming, problem-solving, project and quiz or the traditional method of teaching.

#### *Experimental Design*

The five-group 'Pre-Post-Randomised Matched Design' was followed in the present study.

### *Experimentation*

The experimental study was completed in three phases:

- Phase-I : Administration of verbal and non-verbal tests of creative thinking;
- Phase-II : Teaching of science through the selected curricular activities; and
- Phase-III: Administration of verbal and non-verbal tests of creative thinking to obtain post-test scores on various dimensions of creative thinking.

### *Analysis of Data*

The statistical technique of analysis of co-variance was applied for analysis of the data to study the effectiveness of the curricular activities in the development of creative thinking. The use of 't' test was also made to determine the relative effectiveness of either of the curricular activities over the others in enhancing creative thinking among high school students.

### GENERAL CONCLUSIONS

1. The group of students who were taught science using various curricular activities, namely, brain-storming, problem-solving, quiz and project gained significantly in their verbal fluency, flexibility, originality, elaboration, non-verbal originality, total non-verbal creative thinking and total creative thinking as compared to the group of students taught through the traditional method (lecture method).
2. The use of brain-storming activity in the teaching of science was found to be significantly more effective in comparison to the use of problem-solving, quiz and project activities in the development of verbal fluency, flexibility, verbal creative thinking and total creative thinking, among the students under study.
3. However, the use of problem-solving, quiz and project activities in the teaching of science were found to be equally effective in enhancing verbal fluency among the high school students.
4. The effect of teaching science involving quiz and problem-solving activities was found to be almost equal, but more effective in comparison to the use of project activity in developing verbal flexibility among the students. The group of students taught science through project activity was found to be significantly

- more effective in developing verbal flexibility in comparison to the students taught through the traditional method.
5. The use of brain-storming and quiz activities in the teaching of science was more or less equally effective in developing verbal originality among the students. Both the experimental groups using brain-storming and quiz activities gained significantly more in verbal originality in comparison to the group using project activity.
  6. The effect of problem-solving and project activities in the teaching of science did not differ significantly in the development of verbal originality among the students.
  7. The effect of problem-solving, quiz and project activities in the development of verbal creative thinking was significantly more in comparison to the use of the traditional method.
  8. The group of students taught science involving quiz activity gained significantly in verbal creative thinking in comparison to the group of students who were provided instruction using project activity.
  9. The use of problem-solving and project activities in the teaching of science did not differentiate significantly in their effect on the development of verbal creative thinking among the high school students.
  10. The effect of the use of brain-storming and problem-solving activities in the development of non-verbal elaboration among the group of high school students was of the same magnitude, but significantly more in comparison to the use of project activity. Moreover, the use of problem-solving and quiz activities was found to be significantly more effective than the use of project activity in the development of elaboration.
  11. The group of high school students using brain-storming activity was found to be higher in non-verbal originality in comparison to the groups of students taught science involving quiz and project activities.
  12. The use of curricular activities, problem-solving, quiz and project in the teaching of science was found to be equally effective in the development of non-verbal originality among the high school students.
  13. The use of brain-storming and problem-solving activities was found to be equally effective, though significantly more, in comparison to the quiz and project activities in the development of

total non-verbal creative thinking among the students.

14. The use of project and quiz activities had significant positive effect in the development of the dimensions of total non-verbal creative thinking. However, their effect in the development of total non-verbal creative thinking among the students did not differ significantly from each other.
15. The curricular activities of problem-solving and quiz activities were found to be equally effective though significantly more in comparison to the use of project activity in the teaching of science in the development of total creative thinking among the high school students.

#### EDUCATIONAL IMPLICATIONS

The findings of the present study are suggestive of the fact that the teaching-learning process supplemented by brain-storming, problem-solving, project and quiz activities stimulate creative thinking within the given curricular framework in the school. The positive effect of the use of these curricular activities in teaching science in terms of gain of the students in their creative potential has immense use in the improvement of the existing science curriculum and teaching methodology.

The educational process should encourage not only academic talent but other talents like creative talent, decision-making talent and problem-solving abilities. This calls for planning of teaching strategies of creative teaching and creative learning. A high level of psychological safety should be provided in the classroom and there should be little teacher domination in the classroom, the process of learning should be kept more student-centered so as to help the young learners to apply their knowledge in solving newer problems and in taking tasks of increasing complexity at their own. Inquiry-oriented and student-centered activities contribute considerably to the development of creative talent. The use of frequent questioning by teachers, especially open-ended, divergent questions leading to creative thinking, teacher's unauthoritarian group approach, use of specially enriched educational programmes with incentives and rewards, radical reorientation in the methods of teaching without involving any financial constraints will definitely increase efficiency, initiative, creativity and foresight of the students.

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*Reading Skills of Precocious and  
Average Readers in First  
and Second Language Learning*

VERNA SABHARWAL

READING represents a unique challenge to anyone seriously interested in human thought processes. It is an activity that binds together perceptual, memorial and linguistic functions and that, once mastered, allows the minds of two people—reader and writer—to be more intimately joined than any other form of social encounter" (Alan Kennedy, 1984, *The Psychology of Reading*, XIII).

The history of mankind, in general, and that of education, in particular, has witnessed a ceaseless effort to bring about a lasting relationship between the human child and printed language. Perhaps this explains why much of reading research has been carried out on elementary level students.

Reading research during the past twenty years has been characterised by simultaneous effort at many fronts. These new areas in reading research imply a shift from its earlier focuses. Contemporary reading

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research is now concerned with (a) the nature of reading process as an integration of perceptual, memorial and linguistic functions; (b) the role of cognitive processes in reading; (c) the nature of reading comprehension; (d) the models of reading and component skills of the reading process; (e) the role of environmental factors in developing better reading proficiency; and (f) the relationship between reading and writing.

However, in its new concerns, reading research has largely left the phenomenon of precocious readers unexplored. The sheer magnitude of reading failure is primarily responsible for this neglect. A small part of reading research during the 1980s has been concerned with the nature of precocious reading. This study is an attempt in understanding the characteristics of reading performance by precocious readers and various environmental factors that possibly contribute to reading precocity.

#### OBJECTIVES

The following were the main objectives of the present study:

1. To analyse the nature of the reading process used by the precocious and the average readers in terms of various reading skills.
2. To study the level of reading comprehension of the precocious and the average readers on  $L_1$  and  $L_2$  prose texts.
3. To examine and compare the level of factual and inter-pretive comprehension of prose texts by the precocious and the average readers
4. To study the incidence and typology of miscues made by the precocious and the average readers.
5. To examine syntactic and semantic acceptability of various types of miscues made by the precocious and the average readers.
6. To examine the evidence regarding transfer of reading skills across  $L_1$  and  $L_2$  through various reading tasks performed by the precocious and the average readers.
7. To compare and analyse the reading performance of the precocious and the average readers in terms of various aspects of the reading process
8. To propose a model of reading that explains and accounts for various differences between the reading performance of the precocious and the average readers.
9. To study the reading behaviour of the precocious and the average readers and their perception of various environmental factors contributing to their reading proficiency.

10. To develop a generalised profile of the precocious reader as distinguished from the average.

The concomitant objectives of the study related to preparation and standardization of various tools necessary for data-elicitation.

#### HYPOTHESES

The following hypotheses were formulated for testing through this study:

1. The nature of the reading process in terms of various reading skills used by the precocious readers is the same as that used by the average readers.
2. The precocious readers perform at a higher level of reading comprehension than the average readers.
3. The precocious readers do not differ from the average readers in factual comprehension of texts.
4. The precocious readers perform better than the average readers in terms of interpretive comprehension of texts.
5. The average readers make more miscues and more varieties of miscues while reading aloud the text than the precocious readers.
6. The precocious readers make more syntactically acceptable miscues than the average readers.
7. The precocious readers make more semantically acceptable miscues than the average readers.
8. Reading skills are transferable across  $L_1$  and  $L_2$ .
9. The precocious readers are better able to transfer reading skills across  $L_1$  and  $L_2$  than the average readers.
10. The precocious readers differ from the average readers in terms of their use of various reading skills.
11. The precocious readers perceive greater contribution of environmental factors to the development of their reading proficiency than the average readers.

No hypotheses were framed for objectives No. 8 and 10. Of the 11 hypotheses formulated for this study, hypotheses No. 1,6, 7,8, 10 and 11 were not tested statistically; these were tested through qualitative analysis of the data.

#### TOOLS USED FOR DATA COLLECTION

The following tools were developed by the investigator and used

for data-collection in this study:

1. Reading Performance Rating Scale (RPRS)—for teachers to rate the reading proficiency of their students on a five-point scale on four aspects of reading. These aspects were (a) reading fluency, (b) reading comprehension, (c) pupil's overall response to reading tasks, and (d) reading performance-based placement
2. Two batteries of six tests, one for Hindi and the other for English, on visual recognition and discrimination (VRD) of shapes, letters and words.
3. A fifty-item isolated word test for studying of word attack strategies and pronunciation of unfamiliar English words.
4. A set of six prose passages (three in Hindi and three in English) for eliciting miscues and studying factual and interpretive comprehension. These included comprehension questions and Teacher's Record Sheet (TRS) for each passage for recording miscues, their frequency and score on factual and interpretive comprehension.
5. Reading Interview for eliciting additional information on reading behaviour and data regarding the perceived role of environmental factors in the development of reading proficiency.

#### SELECTION OF SAMPLE

The process of sample selection was carried out in two rounds. The first round resulted in selection of four English-medium public schools out of 14 such schools of Delhi, West Zone. These sample schools were selected on the basis of three criteria:

1. Each of these schools had a primary feeder section.
2. Teaching of Hindi and English commenced simultaneously in Grade I in each school
3. Each school had comparable result at the secondary school examination in terms of distinctions, first divisions and total pass percentage

The second round of sample selection began with the identification of precocious readers. Every Grade IV student in these schools was rated for reading proficiency in Hindi on the Reading Performance Rating Scale (RPRS) by his/her Hindi teacher. These teachers were oriented to the task through orientation sessions. In all, 497 Grade IV students were rated on RPRS. Of these, only 39 were identified as precocious readers. These were rated once again by Hindi teachers who had taught them during the previous year when they were in Grade III. Only such students were accepted as precocious readers who were unequivocally rated as precocious



by both teacher-raters. This cross-validation of the precocious readers finally yielded 28 of them. From amongst the average readers 28 were selected randomly so that each school had an equal number of precocious as well as average readers in the student-sample.

#### DATA COLLECTION

All tests for data collection were administered individually and in the same order for each student. The order of test administration for various tests was as under:

1. Battery of VRD tests: Hindi
2. Battery of VRD tests: English
3. Isolated Word Reading Test
4. Miscue Elicitation Passages: Hindi
5. Miscue Elicitation Passages: English
6. Comprehension Passages: Hindi
7. Comprehension Passages: English
8. Reading Interview

For most students, test administration was spread over two meetings, with some, it could be completed during three meetings. No one other than the student and the investigator was present during these meetings. The tests were administered and the data collected during January-April 1987. Tests 1 and 2 were speed tests and these were strictly timed. Performance on all other tests was tape-recorded and later on transcribed and proof-listened for accurate transcription. Follow-up meetings had to be arranged for those students who were absent during visits to a sample school. All responses were scored according to a pre-determined scheme for each test. Responses on VRD batteries were scored for errors. Miscues were unit-scored. Factual comprehension scores were based on the unit-score for each correct response. Answers to 'main ideas' were scored differentially according to low, mid, or high level of abstraction in response.

#### ANALYSIS AND INTERPRETATION OF DATA

All data were graphically presented through bar-graphs for first level comparison and discussion. Sample statistics in terms of mean, SD and range were calculated for each set of data for the precocious readers as well as the average readers. Different tests were used for statistical inference depending upon the nature of the variables. Because of similar items the error scores on VRD tests were clubbed for Tests I and II, Tests III and IV, and Tests V and VI, and Chi-square test was used for significance of differences between the precocious readers and the average readers on

VRD errors. 't'-ratio test was used on other sets of data to determine the significance of mean differences between the average and the precocious readers. Correlational analysis was carried out with the help of Spearman's method of rank differences for various component skills of the reading process. The results of the quantitative analysis of the data are presented in capsule form in Tables 1-4.

TABLE 1  
Statistical Analysis of VRD Error-scores

Tests	Precocious		Average		$\chi^2$	P
	M	SD	M	SD		
L <sub>1</sub>	I & II	4.07	1.38	4.34	1.27	0.186
	III & IV	3.69	1.38	4.69	0.95	3.10
	V & VI	2.73	1.16	4.80	0.92	14.88 < 0.01
TOTAL	10.50	2.67	13.84	2.14	11.96 < 0.01	
L <sub>2</sub>	I & II	3.23	1.25	4.5	1.15	5.42
	III & IV	2.0	0.85	3.8	2.01	15.69 < 0.01
	V & VI	2.6	1.53	4.19	1.19	9.50 < 0.01
TOTAL	7.84	2.37	12.58	2.89	28.48 < 0.01	

TABLE 2  
Statistical Analysis of L<sub>1</sub> Miscues

Type	Precocious		Average		't' ratio
	M	SD	M	SD	
Insertion	1.23	1.35	2.23	1.09	2.88 *
Omission	0.46	0.65	1.58	0.94	4.91 *
Repetition	5.9	3.14	7.84	4.92	1.66
Reversal	0.27	0.38	0.19	0.17	0.96
Substitution	6.42	3.67	6.77	3.28	0.36
Correction	2.73	1.73	1.77	1.13	2.32
TOTAL	14.23	6.98	18.61	8.17	2.28

\*Significant at 0.01 level

TABLE 3  
Statistical Analysis of L<sub>1</sub> Miscues

Type	Precocious		Average		t' ratio
	M	SD	M	SD	
Insertion	0.12	0.41	0.73	1.03	2.77*
Omission	0.31	0.54	0.89	1.02	2.52**
Repetition	1.23	1.30	2.73	1.76	3.41*
Reversal	-	-	-	-	-
Substitution	4.88	1.88	8.77	5.17	3.54*
Correction	2.84	0.95	0.88*	0.49	9.33*
TOTAL	6.73	2.67	13.1	5.08	5.90*

\*significance at 0.01 level.

\*\*significance at 0.05 level.

TABLE 4  
Statistical Analysis of Reading Comprehension Data

	L <sub>1</sub>					L <sub>2</sub>				
	Precocious		Average		t'	Precocious		Average		t'
	M	SD	M	SD		M	SD	M	SD	
Details	7.2	0.83	5.6	1.12	5.71*	10.57	0.92	6.46	1.10	14.32*
Word Meaning	5.2	0.87	3.5	1.05	1.45	4.53	0.88	2.00	0.73	11.05*
Inference	13.0	2.05	5.3	1.74	16.26*	14.88	1.86	9.42	1.21	16.96*
Main Ideas	5.2	1.21	3.0	0.83	7.59*	5.10	0.93	3.84	1.00	4.62*
TOTAL	30.7	2.25	17.5	2.64	19.13*	35.08	1.90	21.73	2.53	21.09*

\*significance at 0.01 level

Qualitative analysis of the data was also carried out in respect of syntactic and semantic acceptability of miscues and general reading behaviour and perception of the contribution of environmental factors.

#### MAJOR FINDINGS

Even though various hypotheses were tested statistically as part of

data analysis, the findings are based on qualitative analysis as well. The analysis of the data and their interpretation revealed that

- (a) The precocious readers perform at a higher level of reading comprehension than the average readers (Hypothesis 2 was accepted)
- (b) The precocious readers do not perform as well or better than the average readers on factual comprehension of  $L_1$  texts though they perform better on factual comprehension of  $L_2$  texts than the average (Hypothesis 3 was accepted for  $L_1$  texts but it was rejected for  $L_2$  texts).
- (c) The precocious readers perform better than the average readers in terms of interpretive comprehension of texts (Hypothesis 4 was accepted).
- (d) The average readers make more miscues on all varieties of miscues than the precocious readers; however, the miscues made by the precocious readers are of as many and the same categories as those of the average readers (Hypothesis 5 was thus accepted in terms of frequency of miscues but it was rejected in terms of unequal varieties of miscues by the precocious and the average readers). The precocious readers make more correction miscues than the average readers.
- (e) The nature of the reading process used by the precocious readers is essentially different from that used by the average reader; the two groups of readers differ in their use of, and reliance on, various reading skills for performing reading tasks (Hypothesis 1 was rejected).
- (f) The precocious readers make more miscues that are syntactically acceptable than do the average readers (Hypothesis 6 was accepted).
- (g) The precocious readers make more semantically acceptable miscues than the average readers (Hypothesis 7 was accepted).
- (h) Reading skills are transferable across languages; reading skills are transferred from the more familiar and the more practised language irrespective of whether it is  $L_1$  or  $L_2$  (Hypothesis 8 was accepted).
- (i) The precocious readers excel the average readers at transfer of reading skills across  $L_1$  and  $L_2$  (Hypothesis 9 was accepted).
- (j) The precocious readers rely more on their use of higher reading skills while the average readers rely more on lower reading skills; the reading performance of the precocious readers is better accounted for by the top-down interactive model and that of the average readers by the bottom-up interactive model of reading (Hypothesis 10 was accepted).
- (k) The precocious readers perceive their home environment as a major

contributing factor to their reading precocity; their home environment contributes through better guidance, greater parental interest and more facilities for personal reading to reading proficiency of the precocious readers; the contribution of the school is relatively negligible (Hypothesis 11 was accepted for perceived contribution of home environment but it was rejected for school environment).



### *Children's Curiosity, Intelligence, and Scholastic Achievement*

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**I**T is borne out by a review of the studies and literature pertaining to the present investigation that curiosity is an important human characteristic or trait which contributes to learning, problem solving, creative thinking and balanced personality development. This trait can be enhanced by making the environment full of novelty and surprisingness. The attempts to study, maintain and encourage curiosity should preferably be focussed on school-age children as they are at the stage of speedy mental growth. Keeping this in mind and finding a dearth of studies in India in this area, the present study was planned.

#### OBJECTIVES

The following objectives were framed for the study:

1. To identify the high and low curiosity pupils.

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\*Degree awarded by Agra University, Agra (1990)

2. To find out the relationship between the variables curiosity and intelligence, curiosity and scholastic achievement, curiosity and scholastic achievement controlling intelligence, and intelligence and scholastic achievement.
3. To find out sex and rural-urban differences with regard to curiosity.
4. To find out whether high and low curiosity pupils differ in respect of their intelligence and scholastic achievement.
5. To find out how far the combination of the variables curiosity and intelligence contributes to the prediction of scholastic achievement.
6. To make suggestions for the use of teachers, parents and researchers.

#### HYPOTHESES

The following hypotheses were formulated and tested in the study:

1. There is a significant positive relationship between curiosity and intelligence.
2. There is a significant positive relationship between curiosity and scholastic achievement.
3. There is a significant positive relationship between curiosity and scholastic achievement partialling out the effect of intelligence.
4. There is a significant positive relationship between intelligence and scholastic achievement.
5. There are significant sex-differences in respect of curiosity.
6. There are significant rural-urban differences in respect of curiosity.
7. High and low curiosity pupils differ significantly in respect of intelligence.
8. High and low curiosity pupils differ significantly in respect of scholastic achievement.
9. Scholastic achievement of the children can be predicted by their curiosity and intelligence.

#### METHOD

The normative survey method of research was adopted in the present study.

#### VARIABLES INVOLVED

In the present study curiosity was an independent variable.

Intelligence was also considered an independent variable when it along with curiosity was used in the prediction of scholastic achievement. The scholastic achievement of the pupils was considered a dependent variable. High and low curiosity groups, sex and rural-urban background were considered as moderator variables. The factors class, age, syllabus, medium of instruction and socio-economic status were the control variables, controlled by using an appropriate sampling device.

#### SAMPLE

The sample of the study consisted of 1024 pupils (including 572 boys and 452 girls) of Class VII studying in randomly selected private and government secondary schools and intermediate colleges of Aligarh District, recognised by the Madhyamik Shiksha Parishad, Uttar Pradesh. Convent schools and junior high schools were not taken into consideration because of the difference in their set-up and standard.

#### TOOLS USED

The following tools were employed for data collection:

1. Test of Curiosity (Hindi) developed by the investigator by adapting and revising Maw and Maw's Self-rating Instrument of Curiosity.
2. General Intelligence Test (Hindi) developed by Dr. R K. Tandon.
3. School examination marks in the five subjects, namely, Hindi, English, Mathematics, Social Studies and General Science were considered as the scholastic achievement of the pupils and were obtained from the schools' records.

#### STATISTICAL TECHNIQUES USED FOR ANALYSING THE DATA

The collected data were organised, classified and analysed statistically. Statistical techniques like mean, median, mode, standard deviation, skewness, kurtosis, t-test, product-moment correlation, partial correlation, multiple correlation, coefficient of determination and regression analysis were employed to analyse the data.

#### FINDINGS AND CONCLUSIONS

##### (a) *Identifying High and Low Curiosity Children*

In view of the objectives of identifying high and low curiosity pupils, a verbal test of curiosity was developed by the investigator to

assess the curiosity of the school children belonging to the Hindi-speaking areas of India by adapting and revising Maw and Maw's Self-rating Instrument of Curiosity. The instrument proved capable of identifying high and low curiosity children.

*(b) Relationship among the Variables*

1. The coefficient of correlation ( $r$ ) between curiosity and intelligence was found to be 0.21 which indicated low positive correlation between the two variables. It was found to be significant at 0.01 level. It has been concluded that there exists a significant positive relationship between curiosity and intelligence.

2. The coefficient of correlation (0.27) between curiosity and scholastic achievement was found to be significant at 0.01 level. It has been concluded that there exists a significant positive relationship between curiosity and scholastic achievement.

3. The coefficient of partial correlation (0.19) between curiosity and scholastic achievement partialling out intelligence was found to be significant at 0.01 level. It can be concluded that curiosity and scholastic achievement correlate significantly when intelligence is partialled out.

4. The coefficient of correlation (0.54) between intelligence and scholastic achievement was found to be moderate and significant at 0.01 level. It has been concluded that there exists a substantial positive significant relationship between intelligence and scholastic achievement. This can also be generalized in this way that a pupil high in intelligence is likely to get better scholastic achievement than the pupil low in intelligence.

*(c) Sex and Rural-urban Differences Regarding Curiosity*

1. The mean curiosity score (101.32) of the boys ( $N=572$ ) was found to be significantly higher than that (98.47) of the girls ( $N=452$ ) at 0.01 level. It can be concluded that the girls tend to be less curious than the boys in respect of curiosity. Smith (1957) reports that the girls tend to be less curious than the boys because of greater parental restrictions on their freedom and explorations. This may be the case here in the present investigation of the girls being lesser curious than the boys.

2. The mean curiosity score (100.4) of the urban pupils ( $N=842$ ) was not found to be significantly higher than the mean curiosity score (98.46) of the rural pupils ( $N=182$ ) at 0.05 level. It has been concluded that curiosity is not rural-urban biased.



*(d) Differences between High and Low Curiosity Groups in Respect of Intelligence and Scholastic Achievement*

1. Significant differences between the means of intelligence scores of the high curiosity (N=149) and the low curiosity (N=202) groups were found with the high curiosity children showing significantly higher intelligence ( $M=122.29$ ) than the low curiosity children ( $M=111.88$ ). It has been concluded that the high curiosity pupils show significantly higher intelligence than the low curiosity pupils. It confirms this notion that curiosity is the sign of vigorous intellect.

2. Significant differences between the means of the scholastic achievement scores of the high and low curiosity groups were also found with the high curiosity pupils showing significantly higher scholastic achievement ( $M=106.85$ ) than the low curiosity pupils ( $M=93.16$ ). It can be concluded that the high and low curiosity pupils differ significantly in respect of their scholastic achievement with the high curiosity pupils showing significantly higher scholastic achievement than the low curiosity pupils.

*(e) Prediction of Scholastic Achievement*

Scholastic achievement was predicted by treating curiosity and intelligence as independent variables through the multiple linear regression equation. The obtained linear regression equation indicated that for every unit increase in curiosity ( $X_1$ ), scholastic achievement ( $Y$ ) would increase 0.23 unit and that for every unit increase in intelligence ( $X_2$ ), scholastic achievement would increase 0.60 unit. Through the computations of multiple coefficient of correlation ( $R=0.56$ ) and the coefficient of determination ( $R^2=0.3136$ ) it was found that scholastic achievement could be predicted by combining curiosity and intelligence up to 31.36 per cent. It has been concluded that scholastic achievement can be predicted by combining curiosity and intelligence up to 31.36 per cent.

EDUCATIONAL IMPLICATIONS

The findings of the present investigation are quite hopeful and positive and may be utilized for creating proper teaching-learning environment in the classrooms. The test of curiosity developed by the investigator may be used for identification of high and low curiosity children in the classrooms in Hindi regions. In the study the high curiosity children were found showing significantly higher intelligence and scholastic achievement than the low curiosity children. The

knowledge of these findings may be helpful for the teachers in understanding the low curiosity children and in stimulating their curiosity. This may ultimately promote the scholastic achievement of the pupils. By making use of effective instructional materials and methods, teachers can encourage the curiosity of their children. By avoiding a squelching attitude and by giving satisfactory answers to their questions, teachers will not only be stimulating their curiosity but also will be building a feeling of confidence in them.

Parents may take advantage of the findings of the present study in building the future of their children. The parents who tend to depress the inquisitiveness of their children by discouraging their questions may be able to understand that their this type of attitude may reduce the child's ability and opportunity to learn and may ultimately reduce his scholastic achievement. This type of attitude may also affect the healthy personality development of the child. Parents should always give their children the privilege of exploring by providing additional opportunities for them to do so.

#### SUGGESTIONS FOR FURTHER RESEARCH

The following are some broad suggestions on the lines of which further research may be conducted:

1. Children's curiosity may be assessed on different samples with the curiosity test developed by the investigator.
2. The study should be replicated with a standardized test of scholastic achievement.
3. The study of children's curiosity in relation to rural-urban background should be repeated with large samples. As it was the investigator's novel attempt, it needs further scientific verification.
4. The study of children's curiosity in relation to different demographic, cognitive, personality, affective, social and other variables may be undertaken.
5. Scholastic achievement of the pupils may be predicted by combining certain other variables such as socio-economic status, personality factors, etc. with curiosity and intelligence.
6. Factors which stimulate curiosity in children need to be investigated, identified and promoted in the children.
7. Other standardized tools for assessing curiosity may be developed under Indian conditions.
8. The study may be replicated on the children studying in convent schools and junior high schools.



*An Investigation into the Impact of Educational  
Television Programmes on the Competency of  
Teachers of Elementary Schools*

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THE present study is an appraisal of the extent to which Educational Television (ETV) has exerted influence upon the teachers of elementary schools in terms of increasing their competency. The teacher competency has been measured in terms of knowledge, understanding and applications in content areas, and interaction between the teachers and the students in the classroom. Besides, the study has also attempted to assess the attitude of the teachers towards ETV programmes; to identify the problems encountered by the teachers with respect to utilization of ETV programmes; and to seek suggestions towards improvement of the quality of the programmes.

This study incorporated both survey and field experiment design and to some extent case study approach was also utilized. In essence, quasi-experimental field study design was adopted to measure the impact of ETV programmes on the competency of teachers through testing of pre-formulated hypotheses.

In total, 25 TV schools were chosen randomly out of 230 TV schools of four educational districts of Sambalpur (Orissa). Keeping in view the teacher's age, qualification, teaching experience, intelligence, etc. an equal number of non-TV school samples were drawn strictly on matching with their counterparts of TV schools. From each school two teacher-custodians were chosen as respondents, thereby providing two matched samples of 50 each in both experimental and control settings. Similarly, a student sample of 20 each from both the settings were selected randomly. Furthermore, 25 inspecting officers were also selected randomly from the said four educational districts in order to

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Thesis submitted to Utkal University (1990)

provide data pertaining to problems and remedies of ETV utilization.

Three different tools were devised and utilized for gathering data in accordance with the objectives of the present study. The Competency Based Achievement Test (CBAT) in particular was pretested and validated before its application. One opinionnaire and two feedback schedules, though not validated, were thoroughly scrutinized by experts. Besides, one standard test called Flander's Interaction Analysis Categories (FIAC) technique was used to assess different teacher-pupil ratios.

The data collected from the selected samples were analysed through the application of ANOVA and 't' test to see whether significant differences existed between the teachers of TV and non-TV schools pertaining to their achievement and interaction. Quantitative analysis was made to assess the attitude of the teachers towards ETV programmes and to identify their problems, and to pool their suggestions with respect to ETV utilization.

The obtained results corresponding to the impact of ETV programmes on the competency of the teachers indicated significant differences between the TV and non-TV teachers on their knowledge, understanding and application in the covered content areas. The result of ANOVA also showed a significant difference between both the groups of teachers ( $P < 0.01$ ). Possible combinations were tried with the application of 't' test to locate the exact and specific point of difference. In all the three cases, viz. knowledge, understanding and application, the level of difference was highly significant, thereby corroborating the superior mean achievement scores of the exposed teachers indicating favourable impact of the medium of ETV.

It was also evident from ANOVA that the interaction effects between the teachers and their competencies were significant ( $P < 0.05$ ) and thus further proving that the exposure yielding improved competencies among the teachers.

The computed 't' values for the Teacher Response Ratio (TRR), Teacher Question Ratio (TQR) and the Pupil Initiation Ratio (PIR) indicated significant differences at 0.01, 0.01 and 0.05 levels, respectively. Therefore, it further highlighted the superior competencies of the teachers of the TV schools over their counterparts in non-TV schools.

Furthermore, the attitude of the teachers towards ETV revealed that a highly significant chunk of teachers (92 per cent) considered ETV as not only an effective medium but also conducive to teaching and development of teachers' knowledge and general awareness. An equally

higher number of respondents corroborated favourable attitude towards the utilization of the medium, suitability of the format, content structures, etc.

However, according to the opinion of the teachers regarding problems connected with adequate utilization of the medium in the classroom, mechanical disorders, power failure, unsuitable time slot for teacher programme, duration of the teacher programme, insufficient remuneration to teacher custodians and inadequate supply of support materials were among the most vulnerable problems.

All the findings taken together helped to formulate several valuable suggestions corresponding to content structure, programme planning, production strategies, utilization and evaluation as well as follow-up.

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## Research Notes

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### *Women's Magazines and Education*

P.E. THOMAS  
C. PICHANDY

WOMEN'S magazines deal with specific subjects which are of interest to women. The popularity of women's magazines is discernible from their large circulation and readership subsequently admitting them into the 'general interest' group. This development, a gradual one, took place simultaneously with that of woman's emancipation from old restraints and reflecting her greater interest and participation both at home and outside it. The aftermath of the First World War brought woman a greater share of work and responsibility outside the home, and these were matched in the press by woman's features to meet this larger interest.

Women's magazines are distinguished from other media mainly by

the fact that they are directed specifically to, and read primarily by, women. This calls for criticism from certain quarters, which state that the continued confinement to women's concerns, though a part of life, forestall women's knowledge in areas such as politics, international issues, disarmament, etc. It suggests that magazines should not only deal with subjects with "women's point of view" but just from the human point of view. Contrarily, women are satisfied with what they have in these magazines and those desirous of knowing about other subjects could either read other publications. Furthermore, these days women have access to other media such as Radio, TV, VCR, etc. Because so many media are available to them but their personal time is limited, they are forced to be more selective in their choices. So, the media themselves have been forced to fight harder than ever for the consumer's time. Though there is a shift in lifestyles of women resulting from more and more women joining the workforce, their basic impulses are not expected to change. There are going to be more women's magazines in the news stands, each of them focusing on the type of woman it serves, yet women are still going to keep worrying about their family. Kate Rand Lloyd, editor of 'Working Woman' observes, "I don't believe women's basic impulses are going to change. I think they are going to go right on thinking about men and falling in love and worrying about kids."

While picturing the contents of women's magazines, the traditional content is found to be more common (traditional content being advice, astrology, beauty, brides, charity, benefits, clubs, fashion, food, home furnishings and society events). However, the modernized lifestyle sections differed from the traditional women's sections, which comprise entertainment content. According to the editor of the 'Times' women's page, the magazine should carry "news about women, not news for women". This refers to coverage of women's movement, the changes in women's lives and the effects of women's movement. Though women are potential newsmakers, only their most obtrusive actions are newsworthy. A woman has to be twice as newsworthy as a man to get the same coverage. An additional bias against women and women's issues may be built in by the simple fact that reporters and editors are almost all males. This is a major factor in the upsurge of women's magazines and most of them headed by women.

#### IMAGES OF WOMEN IN MAGAZINES

If we look closely, the content of women's magazines are just an expansion of the token women's page that used to be incorporated in

general magazines or the Sunday issues of daily newspapers.

### *North America*

Three women's periodicals were selected for analysis, i.e. "McCall's" and "The Ladies' Home Journal" (LHJ) which occupy the leading position in terms of circulation among the family-oriented magazines and 'Cosmopolitan' aimed at the 18-24 year old career woman. 'Playboy' the nation's best-selling men's magazine, was also included on the basis of research indicating that it is the most widely read publication among employed female readers. The study purported to examine which role models the magazines presented, how they reflected social reality and what their positions were regarding the changing roles of women. Articles dealing with female employment reflect great disparity between 'McCall's' and 'LHJ'. 'McCall's' is ambivalent towards working wives and ignores working mothers. The emphasis on traditional roles for women reflects the orientation of the magazine's audience, as appears from readers' correspondence. In contrast with this traditional view, 'McCall's' presents profiles of successful women in a wide variety of fields, including non-traditional occupations. 'LHJ' does not restrict women to their domestic roles. It condones employment preferably part-time, for married women and mothers, although the majority of its audience was found to favour the rôle of home-maker.

'Cosmopolitan' is a magazine for women but about men. Its main focus is on how to get a man and keep him. Work is presented as an opportunity to meet men, and job descriptions tend to be glamourized and romanticized. Regarding 'Playboy' the researchers found that the non-fiction content reflects a general disinterest in women outside sexual relationships. Male-female relationships are a major topic in all four magazines.

'Cosmopolitan' gives precedence to the importance of men in women's lives and to sexual freedom over psychological, social or political liberation. 'McCall's' has been the most constant in emphasizing traditional roles for women at least until its female editor, appointed in 1969, gradually changed its orientation towards support of feminist aims and issues. 'LHJ' has been the most heavily criticised among the women's magazines. In defence of its tradition-oriented context and outlook, its male editor argues that the majority of its readers choose a home-centered life. 'Playboy' is ambivalent towards the liberated woman, but only reacts against the anti-male feminist faction.



*Asia*

The seminar on "The role of mass media in changing social attitudes and practices towards women" focused on the importance of women's magazines for communicating information to the female population of India. An analysis of Hindi periodicals over the past 30 years showed a steady decline in the discussion of women's issues.

Women's magazines in India focus almost exclusively on food, fashion and beauty, thus reinforcing the traditional roles of women. Information about relevant socio-economic issues including the status of women is largely lacking. The dependence on advertising, which is often blatantly sexist in its depiction of sex roles, is indicated as one of the major reasons for the perpetuation of traditional female images. The danger lies in the fact that, by restricting women's reading to these stereotyped areas, the media is feeding them with a placebo that lulls their discontent into slumber forcing them to put a lid on their frustrations. They also actively espouse the virtues of women being confined to the home and constantly list the dangers of working outside the home. Are women really not interested in political and economic news? Don't women need to be encouraged to improve their lot? Won't they be interested in what is happening to their sisters outside their own neighbourhood?

The implication of labelling a section "women's" is that we are encouraged to think of women as a special class of people, and when this is coupled with traditional content in the section, the message is obvious that woman's place is different from a man's, less significant and it is in the home. If we are using the media to construct social reality, we should be relying more heavily on reality-oriented content. Attitudes, tastes and lifestyles are becoming the crucial factors which increasingly guide the communication strategies of women's magazines. The success formula of all women's magazines, regardless of socio-demographic audience variables, appears to be firmly based on a balance between two major ingredients, service and entertainment.

There is an overwhelming response for women's magazines in India. It is significant to note that both regional language and English magazines perform well in their own spheres. These magazines deal in issues involving women both at home and out in the society. Women's magazines in English have found a very prominent position in the readership chart. 'Femina', 'Woman's Era', 'Savvy' and 'Eve's Weekly' (which folded up) are popular among women readers in India. They carry articles on various social, cultural and economic issues related to

women, profiles of women achievers and carry various reader-service columns ranging from cookery to beauty, legal and personal advice, etc. 'Femina' and 'Woman's Era' are fortnightly, while 'Savvy' is a monthly. These magazines have also been criticized by readers for dealing too much with recipes, beauty tips, child rearing, etc. One question raised is, whether women are really interested in only these issues. All magazines are concerned with the status of women in society and the women's liberation movement. Depending on the intensity with which the issues are treated in every magazine, the interpretation might differ from magazine to magazine. These English magazines for women are bound to have an impact on their readers because of the response they get from readers. This study delves into the educative columns of these magazines, which comprise socio-cultural issues, in order to gauge the impact in terms of their utility among women readers.

#### OBJECTIVES OF THE STUDY

This study had the following objectives:

- To know the utility value of the features presented in the magazines.
- To explore the importance of women's magazines to women when compared to other magazines.
- To find out whether the content leads to attitude change relating to socio-cultural issues concerning women.
- To find out whether the magazines influence their readers to work for women.

#### METHODOLOGY

An exploratory survey was undertaken for the study for which the questionnaire technique was adopted for the collection of primary data. The questions were designed on the basis of the contents of the English magazines for women, viz. 'Woman's Era', 'Femina' 'Eve's Weekly' and 'Savvy'. Excepting a few, all queries were close-ended in nature. Simple Random Sampling method was engaged for the study which involved 100 female respondents in the city of Madras.

#### OPERATIONAL DEFINITIONS

Reader-service sections : Fashion, cookery, beauty, health, parenting and child care, household tips, legal information, travel, personal columns, etc.

Socio-cultural issues : Marriage and divorce, career, dowry, rape, female infanticide, abortion, eve-teasing, love and sex.

## DISCUSSION

### *Readership of Magazines*

Readers of magazines among women are the youth, especially students who are either pursuing graduation or post-graduation (56 per cent). Students have more access to magazines which substantiates the statement effectively. Though 'current affairs' magazines have been ranked first in preference by a large segment of the readers (60 per cent) readership of women's magazines is overwhelming (94 per cent). The media preference and use shows a significant disparity among women readers.

This is followed by 'current affairs' magazines (87 per cent), 'Film' (69 per cent), 'Society and City' and 'Specific subject' magazines 45 per cent each and 'children's' (27 per cent).

With regard to news preferences, women are not particular about any specific subject but anything of 'general interest' (48 per cent). Politics is found to have catered to the interests of women to a certain extent (40 per cent) and news on 'Business and Economics', 'sports', 'social issues', etc., take the back seat. Despite women's magazines provide plenty of 'women-related issues' they are preferred by a very negligible number (7 per cent). This reveals a contradiction as readership of women's magazines is found to be high. It may be inferred that women's magazines are considered 'general interest' magazines.

The regularity in readership of women's magazines in English is considerably high (72 per cent). Most of them tend to borrow magazines from friends or circulating libraries and only an iota of them (19 per cent) subscribe to these magazines. Since students meet each other very frequently, the magazines can easily be circulated among them which is the obvious reason for higher readership among students.

The columns chosen by women from the women's magazines in English are 'women's issues' (91 per cent) and 'reader-service' (94 per cent). These are followed by 'fashion' (66 per cent) and 'fiction' (53 per cent). With regard to the respondents' expectation of a women's magazine by way of contents is that they should contain 'reader-service' columns as stated by the majority (46 per cent). 'Career and education' (34 per cent), crimes and problems (33 per cent), 'women's status' (27

per cent), follow in order of preference. Contrarily, features like 'personal grooming', 'family management', 'fashion', etc. are given less importance. In general, the reasons for reading women's magazines, are many, such as, 'informative' (30 per cent), 'apt for casual reading' (16 per cent), 'entertaining' (15 per cent) and some even said that women's magazines are 'different' (10 per cent) in nature. Response to columns like 'fiction', 'family planning', 'sex', 'education', 'social events' and 'tidbits' is unimaginably low (1 per cent).

N=100 for each variable		
Issues	'Women-related' Issues according to Respondents (in percentage)	Readers' Expectation (in percentage)
Women's status	50	27
Crimes and problems	45	33
Fashion	11	10
Reader service	23	46
Family management	15	23
Career and education	33	34
Legal knowledge	11	10
Personal grooming	8	8
Achievers	19	24
Others	3	13

Among women readers there is a tendency of preserving magazines (53 per cent). This helps readers to utilise the columns for their routine deliberations. Some readers preserve specific sections depending on their interests. Here again 'reader service' section is given priority by the majority (48 per cent). Columns like 'cookery', 'beauty care', 'household tips', are utilised to a considerable extent on a regular basis.

TABLE 2  
Features Preserved by Readers

N=100

Features	Percentage
Issues	14
Reader service	48
Opinion pages	3
Fiction	14
Fashion	7
Others (editorials, photographs, ads)	14

### *Contributions*

Despite the response women's magazines in English enjoy, an insignificant number of readers (14 per cent) only are interested in contributing to these magazines. This is in spite of the fact that the majority of readers are influenced by women's magazines. A major contribution (36 per cent) comes in the form of 'women's issues' followed by 'fiction', 'poetry', 'profiles', etc. (29 per cent). 'Beauty care' (21 per cent) 'cookery' (14 per cent) are the other contributory articles.

### *Magazines and Hobbies*

Since it is not unusual for youngsters to take to hobbies, a majority (86 per cent) of the readers find women's magazines catering to their interests in hobbies. Here again, the 'reader-service' sections manifest their popularity among readers. In more substantiating tones, many readers have taken up hobbies after being influenced by the 'reader service' sections in women's magazines. These features go a long way in performing their part significantly by inspiring readers to a great extent. It may be inferred that no women's magazine would survive without 'reader-service' columns. The magazines become important for readers only through the utility value of these features. Most of the columns are utilised, viz. cookery (76 per cent), 'Health' (72 per cent), 'Beauty care' and 'Home decoration' (64 per cent each), regularly.

### *Women's Liberation*

A large segment (82 per cent) of the readers desire and believe in

the concept of "women's liberation". But according to the perceptions of these readers about "women's liberation", it is not 'freedom' or life without encumbrances, only demands for 'Equal rights' (56 per cent), 'Equal responsibility' (55 per cent) and 'Men recognising women as equals' (50 per cent) are expected to be entertained by the society.

### *Readers' Attitudes to Issues*

Women's magazines in English have not substantially influenced the readers' attitudes to issues. Though they have been helpful in many quarters, the existing attitudes and beliefs of readers could not be altered, but only tended to be retained in certain issues like, 'parenting' (61 per cent), 'love and sex' (60 per cent), 'abortion' (56 per cent), 'marriage and divorce' (55 per cent), 'career' (53 per cent), 'eve-teasing' (49 per cent), 'dowry' (48 per cent) and 'rape' (47 per cent).

Similarly, little influence has been there with regard to the personal actions/decisions of readers on various issues. This results from the unsuitable age-group of most respondents considering many of the issues. 'Marriage and divorce' (29 per cent) and 'career' (29 per cent) are two issues regarding which most respondents have made a decision in their personal actions, which have been influenced by the magazines. Readers whose opinions have changed, attribute it to the magazines which "made them aware of their rights". "Own way of thinking" has been referred by those who have not changed their views.

<p>TABLE 3 Women's Magazines' Influence on Respondents' Attitudes and Respondents' Personal Actions/ Decisions on Various Issues</p>						
N=100 for each variable						
Issues	Attitudes			Personal Actions/ Decisions		
	Chgd. (%)	Ret. (%)	Sim*. %	Yes (%)	No (%)	N. Applicable (%)
Marriage and divorce	26	55	19	29	27	44
Career	21	53	26	29	46	25
Dowry	16	48	36	15	30	55
Rape	8	47	45	13	27	60
Female infanticide and foeticide	18	39	43	15	37	48
Abortion	15	56	29	21	24	55
Eve-teasing	14	49	37	20	38	42
Parenting	15	61	24	17	27	56
Love and sex	16	60	24	21	41	38

\* Changed/Retain/Similar

### *Ideal Magazine*

The features presented in the women's magazines are favoured by the readers. Nevertheless, none of the magazines is termed to be the ideal women's magazine as observed by the majority (39 per cent). There is yet to be a women's magazine that is 'complete'. 'Women's Era' edges put 'Femina' as the ideal women's magazine as pointed out by 22 per cent and 20 per cent of the respondents, respectively.

### *Women's Rights*

Women's magazines explode from page one, with demand for women's rights, either directly or indirectly. But the influence on their readers to work for women's rights is less intensive. Only a small (12 per cent) segment of the women readers work for women's rights and of which only half the number were influenced by the magazines to do so. Even though one is interested in working for it, various factors of constraints like, family, occupation, lack of time, etc. would keep them at bay. However, nearly half the readers (46 per cent) have been inspired by the magazines to work for women and the remaining feel that they do not wield any such influence.

### *Summary of Findings*

The reader-service columns of women's magazines in English, have been found to gratify their readers more than any other feature. These sections which have high utility value are preserved by many readers. The choice of subjects made by those who contribute to women's magazines is centred around women's issues. Women's magazines cater to readers' hobbies through the reader-service sections. Also, some readers took up a hobby after being influenced by the magazines' columns. A very high majority of readers believe in the concept of women's liberation who perceive it as 'equal rights', 'equal responsibility' and 'men recognising women as equals'. The study reveals that the magazines do not wield any significant influence on the attitudes or behaviour of readers regarding various issues. 'Marriage' and 'career' are two important issues regarding which the respondents have made a decision in their personal actions, which have been influenced by the magazines. Readers have observed that the attitudes and ideals present in the magazines are not realistic always. Though women's magazines have won the favour of women readers by inspiring and influencing them, not one of them is 'complete' in nature. With all the specialised

feature in them, these magazines have been bracketed as 'general interest' magazines. Though 'Femina' has been preferred by most, the small segment which opined on the 'ideal' magazine, favoured 'Woman's Era'. The study brings to light that many women are inspired to work for women's rights, but are restrained by various extraneous factors like family, occupation, etc. At the same time only an iota of the readers work for women's rights, but not more than half of them have been influenced by these magazines to do so.

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### Education as News — A Perspective Analysis of Two English Dailies

SYED AMJED AHMED

**E** DUCATION is the foundation of socio-economic development. Its pivotal role in developing a human being as a vital resource for



national development has been well recognised by policy planners in India. The New Education Policy document states: "only education can imbue people with the knowledge, the sense of purpose and the confidence essential for building a dynamic, vibrant and cohesive nation capable of providing its people with the wherewithal for creating better, fuller and more purposeful life".<sup>1</sup>

Today the educational sector presents an impressive picture in terms of quantity and magnitude. There are over 6.9 lakh educational institutions with a student population of 11.4 crores at all levels. And, teachers at all levels number more than 32 lakhs. The total budgeted expenditure on education which is over Rs 5100 crore is the second highest expenditure after defence. This amounts to a little more than three per cent of the Gross National Product of the country. By all accounts, education is a major sector with a crucial role to play in the nation-building activity.

Being one of the major developmental areas with a vast clientele, the educational sector as a news topic/area should figure prominently in our newspapers and other mass media. But, several content analytical studies of newspapers have presented a dismal picture of education as news. For example, a study of two leading English dailies conducted in 1975 and repeated in 1976 has shown that educational news accounted for less than two per cent of the total space<sup>2</sup>. The language dailies too provide a meagre two per cent of their newshole to the news of the educational sector whereas politics and trade union account for over 16 and 10 per cent of the newshole, respectively.<sup>3</sup> Studies of this nature though useful fail to provide an in-depth knowledge about the kind and type of educational news that is often published in newspapers. This study was conceived to assay the nature of educational news that gets programmed in English dailies

Specially the research questions of the study were:

1. What type of educational items are published in English newspapers?
2. Educational news belongs to which sectors.
3. What are the educational news topics that get programmed?
4. Who provides educational news for newspapers?

#### METHODOLOGY AND DESIGN

A content analysis was performed on sample issues of two purposively selected English dailies, *Times of India* (Bombay) and *The Hindu* (Madras). The most often used design of one continuous week and one composite week was used to draw the sample of issues. The

period covered ran from April 1 to June 30, 1985. The continuous week ran from Saturday, June 1 to Friday, June 7, 1985. The continuous week was constructed by choosing one week-day, in turn, every two weeks, beginning with Monday, April 1 and ending on Saturday, June 30, 1985. Thus 14 issues each of the two dailies, *Times of India* and *The Hindu*, were analysed.

The unit of analysis was an educational item appearing on any page of the newspapers. Educational items deal with educational issues, events, institutions, teachers and students. The items meant for the general education of readers were also identified as educational items.

The headline, body copy, pictures and illustrations were treated as an integral part of an item for purposes of measurement. In each of the sampled issues, educational items were identified, coded and measured in column centimeters. Each educational item was classified under the following categories.

### 1. *Type of Educational News*

The type refers to the generic type of the content such as

(a) News, (b) Editorial, (c) Feature, (d) Reader's views (e) Book reviews and (f) Educational comics.

- (a) 'News' means any news item—factual, interpretative and investigative—based on recent happenings and events published on any page of the newspaper.
- (b) 'Editorial' refers to the columns on the editorial page under the newspapers mast head. It expresses the views of the editor publisher.
- (c) 'Features' are not matter-of-fact pieces. They play-up issues and events, they define, explain, provide background information with or without comments. Scholarly articles also were grouped under this category.
- (d) 'Readers' views' refer to views of readers published under standing heads such as letters to the editor, editors mail, complaints etc.
- (e) 'Book reviews' include items which present new books to readers with experts' views on the books under review.
- (f) 'Educational comics' include items such as Kaleidoscope, word play, etc.

### 2. *Educational News Sector*

Educational news was grouped under the following seven sectors:

- (a) Primary education : News items dealing with issues, events, institutions and publics of pre-primary educational level up to VIII standard.
- (b) Secondary education : From Standard VIII to Standard XI; polytechniques; industrial training institutes.
- (c) Higher education : Graduate and post-graduate education; universities; colleges; post Standard XI professional colleges.
- (d) Institutes : National and Regional Institutes, such as IIMS, IITS, National School of Drama, etc.
- (e) Non-formal education : Non-formal education; NAFEP, in-service training programmes.
- (f) Education in general : Items dealing with more than one sector; items with relevance to the educational sector as a whole.
- (g) Other

### 3. Educational News Topics

Topics are the main concern of news items. In other words, topic refers to what the item is mainly about. It comprises 13 categories namely:

- (a) Courses and curriculum : New courses, curriculum, teaching methods.
- (b) Admissions : Admission notices; procedures and problems in getting admission; entrance tests.
- (c) Examinations and results : Announcement and conduct of examinations; authorities' clarifications.
- (d) Educational Institutions : New schools, colleges, universities; changes in governing bodies and government departments.
- (e) Student unrest : Collective demands; agitations of students.
- (f) Policy : Educational policy announcements; debates; suggestions/recommendations.
- (g) Scandals : Scandals involving educational

- |                              |   |  |
|------------------------------|---|--|
|                              | : | institutions, educationists and students.  |
| (h) Co-curricular activities | : | NCC, NSS, Seva Dal, Scout and Girls Guide; college day celebrations; union activities. |
| (i) Teachers                 | : | Professional and service matters; awards; teacher's organisations.                     |
| (j) Research                 | : | Announcement of research grants; research findings, application.                       |
| (k) General education        | : | Items which cater to general knowledge and education of readers.                       |
| (l) Student politics         |   |  |
| (m) Other                    |   |  |

#### 4. Educational News Sources

Sources refer to suppliers of news items. They comprise the following categories:

- |                         |   |  |
|-------------------------|---|--|
| (a) News agencies       | : | UNI, PTI etc.  |
| (b) Paper's own sources | : | Reporters, correspondents of a newspaper; newspapers' service such as Times of India News Service. |
| (c) Contributors        | : | Freelance writers; other contributors.   |
| (d) Syndicated Columns  | : | Syndicates such as Gemini News Service, Asia Features, etc.  |
| (e) Sources not cited   | : |  |

Educational news items with foreign datelines have not been included in the analysis. For the sake of simplicity, a comparison between the two sampled dailies is not attempted here.

#### ANALYSIS AND FINDINGS

##### 1. Educational News Types

There were 179 educational news items occupying 16097.51 column cms of space of the two sampled dailies. This space is referred to as Educational Newshole (ENH). News reports had the lions share (47.37 per cent) of the ENH. The second largest area of space was occupied by features (33.66 per cent). Educational comics such as kaleidoscope, word play, word puzzle, which are published regularly in Sunday supplements had third place. Views of readers on educational issues had

fourth position, followed by book reviews and editorials (Table 1).

TABLE 1 Distribution of Space Among Educational Item Types						
Item Types	Times of India		The Hindu		Sample Total	
	Space in Col Cms	% of ENH	Space in Col Cms	% of ENH	Space in Col Cms	% of ENH
News	2769.4 (75)	41.21	4856.33 (60)	51.79	7625.73 (135)	47.37
Features	2056.36 (8)	30.60	3361.82 (14)	35.85	5418.18 (22)	33.66
Educational Comics	1423.15 (5)	21.18	596.1 (4)	6.36	2019.25 (9)	12.54
Readers' Views	351.9 (4)	5.24	562.85 (7)	6.0	914.75 (11)	5.68
Book Reviews	69.0 (1)	1.03	-	-	69.0 (1)	0.43
Editorials	50.6 (1)	0.75	-	-	50.6 (1)	0.31
Total N =	6720.41 (94)	100.0	9377.10 (85)	100.0	16097.51 (179)	99.99

All figures in parentheses represent number of items

## 2 Educational News Sectors

In the sampled dailies, the higher educational sector was covered better as compared with other educational sectors. Nearly half of the educational news items were about the events and affairs of the higher educational institutions such as the universities and colleges which put together accounted for 30.56 per cent of the ENH. News concerning the educational sector as a whole had the second largest area of the ENH 23.82 (per cent). News about the primary and secondary educational sector had third and fourth places in the ENH. The share of the national institutes and the non-formal educational sector was less than five per cent each (Table 2).

TABLE 2  
Distribution of Space Among Educational Sectors

Educational Sectors	Times of India		The Hindu		Sample Total	
	No of Items	% of ENH (N 6720.41)*	No of Items	% of ENH (N 9377.10)*	No of Items	% of ENH (N 16097.51)*
Higher Education	37	24.74	31	34.74	68	30.56
Education in General	13	23.12	18	24.32	31	23.82
Primary Education	4	11.45	8	10.69	12	11.01
Secondary Education	7	4.30	11	7.86	18	6.37
Institutes	10	5.66	6	3.44	16	4.37
Non-formal Education	4	7.60	1	0.42	5	3.42
Others	19	23.13	10	18.53	29	20.45
Total	94	100.0	85	100.0	179	100.0

\* in col cms

### 3. Educational News Topics

Among all the news topics, items of *general knowledge and information of readers* had the largest share (22.72 per cent) of the ENH. News items dealing with educational policy issues and debates had the second place (15.66 per cent) in the ENH. The third top ranking belonged to scandals (10.46 per cent) involving educational institutions, educationists and students. News about admission matters had fourth place (9.95 per cent), while matters concerning courses and curriculum had fifth place (9.35 per cent) in the ENH. News about new educational institutions and changes in their governing bodies had sixth position (6.62 per cent). The remaining topics had less than five per cent each in the ENH (Table 3)

TABLE 3  
Distribution of Space Among News Topics

News Topics	Times of India		The Hindu		Sample Total	
	No of Items	% of ENH (N 6720.41)*	No of Items	% of ENH (N 9377.10)*	No of Items	% of ENH (N 16097.51)*
General and Educational	16	20.17	11	23.77	27	22.27
Policy	13	20.62	6	12.10	19	15.66
Scandals	6	5.91	12	13.73	18	10.46
Admissions	10	18.39	6	3.90	16	9.95
Courses and Curriculum	10	5.74	11	11.94	21	9.35
Educational Institutions	3	2.17	5	9.81	8	6.62
Examinations and Results	6	1.34	9	5.89	15	3.99
Teachers	4	3.04	4	2.36	8	2.64
Student Unrest	3	1.90	4	2.82	7	2.44
Student Politics	—	—	3	2.55	3	2.48
Research	4	2.53	2	0.59	6	1.40
Co-curricular Activities	2	0.84	—	—	2	0.35
Others	16	17.34	12	10.55	28	13.39
Total	94	99.99	85	100.0	179	100.0

\* in col cms

#### 4. Sources of Educational News

The major sources of educational news were the newspaper's own reporters and correspondents. Their news items covered over 37 per

cent of the ENH. A little over 36 per cent of the ENH was covered by freelance contributors. News agencies such as UNI and PTI provided news to cover as little as 5.88 per cent of the ENH. Uncredited stories accounted for 18.78 per cent of the ENH (Table 4).

TABLE 4 Distribution of Space Among News Sources						
News Sources	Times of India		The Hindu		Sample Total	
	No of Items	% of ENH (N 6720.41)*	No of Items	% of ENH (N 9377.10)*	No of Items	% of ENH (N 16097.51)*
Newspapers' Own sources	45	28.14	40	44.32	85	37.57
Contributors	14	48.78	14	27.74	28	36.52
Sources Not Cited	11	11.92	25	23.70	36	18.78
News Agencies (UNI, PTI)	20	8.18	4.06	4.24	26	5.88
Syndicated Columns	1	0.75	-	-	1	0.31
Others	3	2.22	-	-	3	0.93
Total	94	99.99	85	100.0	179	99.99

\* in col cms

## DISCUSSION

1. Irrespective of the topic, the top-ranking item types in terms of space would be news reports, features and editorials. Generally features and editorials are written on themes and topics of importance. The fact that features and articles on education had second ranking in the ENH indicates that English dailies attach sufficient importance to education. The presence of a solitary editorial on education could be due to the limited space available for editorials each day. Educational comics which had been devoted the third largest space in the ENH cannot be dubbed as waste. These comics certainly enrich the general knowledge of the readers.



2. In respect of coverage of different educational sectors, the over weightage given to the higher education sector could be due to the widely held belief that the single most important indicator of a country's future may well be the state of its higher education. Pandit Jawaharlal Nehru once observed that if all is well with the universities, all would be well with the Nation.

Notwithstanding the above remarks, the primary and secondary educational sectors, which serve as the base for higher education, deserve a better coverage. Through the primary and non-formal educational sectors the country hopes to achieve universal elementary education and adult literacy. If not better, the prospects, problems failures and achievements of these sectors should be projected in the newspapers on an even scale, on par with the higher educational sector.

3. The often-found fault that newspapers print only negative educational news on topics such as students' strike, teachers' strike, scandals involving teachers, students and educational institutions, appears to be little exaggerated. For it is evident from this study that the news topics such as scandals and strikes together contribute to less than 13 per cent of the ENH (see Table 3). Among the top six ranked topics, the only negative topic was 'scandals' at the third position in the ENH.

The priority given to the top ranking educational news topics fits into the general scheme of the programming practices of newspapers. It is indeed interesting to note that English dailies contribute significantly to general education of readers in the areas of health, hygiene, science and technology by publishing a large number of articles and features on these topics.

4. The bulk of educational news is supplied by two sources—newspapers' own correspondents and freelance writers. The fact that most of the articles and features on education were by freelancers points out that teachers can contribute to educational journalism as much as professional journalists.

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## *Educational Reporting on TV in Tamil Nadu*

SUNANDA GHOSH

**I**F journalism is defined etymologically from the root word 'dies' (days), it means a 'daily noting down of events'.<sup>1</sup> Adding the adjective educational to this noun, we may define it as any reporting of events of educational nature on a daily basis.

Besides the daily newspaper, there are several media of journalism, i.e. monthly, bimonthly, fortnightly, quarterly, weekly journals, films, radio and television. As it is quite impossible to keep track of all the journals published in the approved fourteen languages of India, or to view or read reviews of many films that contain directly or indirectly educational news and content or are educative in their impact, or to listen to whatever educational material is put through the radio, an attempt is made here to concentrate on *educational reporting on tv in Tamil Nadu*. All the feature are closely viewed and the contents analysed.

Before launching on the exact content analysis of the educational features, some general comments on the possible impact of such reporting through television may be summarised as follows.

TV reaches a very large audience and its audio-visual impact is far more telling than any printed message on paper. Its facility for image magnification is very useful especially when a very minute process or insect is to be studied. In one of the episodes of 'survival', a minute caterpillar was enlarged several times bigger. The immediacy of the news presented on tv has a definite edge over any reporting done by a monthly, quarterly, or bimonthly journal. It can span the gap of time and space and offer the educational matter in a startlingly 'here and now' way. The process of an event can be captured and brought alive to an audience, for example Calcutta Doordarshan's prize winning documentary (W)hole hearted aarati was a vivid presentation of an open heart surgery. The value of such a programme can be immense especially to a select target group (such as the medical students).

"This capability (of creating a live situation) is enhanced by the ability of the television camera to act selectively as a 'privileged observer' so that all viewing students, wherever they are situated, can observe an event, a phenomenon or a process from the same ideal point of view. Thus an unlimited number of medical students can watch a surgical operation from the best point of vantage".<sup>2</sup>

However, television does not purport to be exclusively an organ of educational journalism. Its function as an entertainment generator and its devotion of its major part of the prime viewing time for this cause has earned it the not-so-fancied name of an 'idiot box'. But notwithstanding the critic's hostility to its misguided role of an entertainer, TV does promote a good deal of education through its various programmes. The following is a summary of the programmes it offers which are directly and indirectly educational.

TABLE I Various Educational Features on TV and the Time Distribution Nov-Dec 1987		
Type of Education	Name of Feature	Total Time in a Week
Physical Education	Yogabhyas, Kip Fit, Dus Kadam	1 hour
Women's Education	Manal Matchi, Stree, Women's programme on Saturday	2 hours
Career Education	Police and Air Force -- talks regarding entry	1 hour
Quiz Programmes	Our Bhi Hai Rahen Quest, Mathemagic What's the Good Word	2 hours
UGC		3 hours 45 minutes
Countrywide Classroom		
Curricular Education	Kanbom Karpom (for middle school)	40 minutes
Enrichment Programme	The World of Survival	30 minutes
Popular Science	Ariviyal Anam	30 minutes
Adult Education	Various programmes under Bhazkal Kalvi, Nalvazham	2 hours
Formers' Education	Bhayalum bhazhabhum Thozhilali Nikayhchi	4 hours
Moral Education	Face in the Crowd	15 minutes
Great Literature	Great Expectation--Dickens Dristidan--Tagore	2 hours
Miscellaneous	Focus, Parliament News	40 minutes
Economic Review	Money Matters	30 minutes
		Total 21 1/2 hours
News in Tamil and English (Morning and Night)		7 hours

The time devoted to the various educational programmes is roughly twenty-one hours, which is approximately one-third of the total time of television relay in a week. The time duration may be regarded generous though many of the programmes are not telecast in the 'prime viewers' time' and may miss the targeted audience. The direct educational programme telecast by the UGC is during 12 noon to 1 PM daily and so does not benefit the target group. Even when it is repeated at 4 PM to 5 PM, it usually is impossible for the school children or teachers to reach home and view it. The concept of integrating it with the classroom lessons has not yet caught up the fancy of the school authorities.

For the same reason author direct educational fare of science education for the middle school (Kanbam Karpom) is not effective—not because it is not well made (it is a sophisticated presentation) but the timing is during school hours and the school does not incorporate it in its time-table.

As regards the quality of the programmes mentioned above it must be admitted that the UGC programmes are technically very sophisticated especially when the foreign-made programmes are shown. Even the India-made programmes on art, history and science are of good quality as testified by the viewers (housewives or retired people). Recently, the UGC is giving programmes under the heading of country-wide classroom. It deals with varied topics such as Galelean mathematics, new economic policy, dawn of mankind, blood is for circulation, energy to go round, language of arts, etc. It has also shown programmes to create environmental awareness. In fact this last mentioned topic is considered as a particularly important.

An excellent projection on life around us including cellular biology, genetic engineering, animal and insect kingdom is projected under the series "The World Survival". It is during a prime viewers' time 5.30 PM to 6 PM and is well received by the audience. These programmes meant for 'enrichment' of viewers' knowledge, serve their purpose.

However, the programmes do not deal with the exact processes or techniques of teaching and cannot be regarded as a substitute for the present teacher training system. What it does, is to extend the boundaries of knowledge of the teachers, who may absorb the content and may impart it to their wards in which ever way they choose to.

There are of course other programmes which are not for the formal school-going age-group. Nevertheless these are educational programmes by their own definitions. A substantial quantum of time (two hours a week) is devoted for adult education programme appropriately named

as Bhazhkkai Kalvi or life-long education. It touches various aspects of adult education right from teaching of alphabets to crisis management during floods or how to go abroad, number of information and skills are taught in attractive drama, dialogue, villupattam form. It gives opportunity to authentic rural artists to perform singing, dancing, dramatising and provides enjoyment to the viewers and encourages creative expression of the performers. Once a week a twenty minutes (5-50-60-10) programme is telecast on health education under the heading *Nal bhayhavu udal*. Besides that medical experts are called upon to discuss about various diseases and their treatment in the 'man and matters' or focus programmes. Health education is also imported through women's programme. The national 'breakfast' tv presents physical education in the morning hours as Yogabhyas, Keep Fit or Dus Kadam every alternate day for fifteen minutes.

Another form of adult education programme is telecast under the heading of Farmer's Education (*Bhayalum bhayhabhum*). This programme deals with varied subjects from pesticide to reports on prize produces. Designed to develop functional literacy, it is addressed to a large audience. It does include urban industrial workers in its weekly programme 'Thozhilali Nikazhcechi, tv devotes 4 hours to this kind of reporting.

Popular science programme is presented in a weekly 30 minutes session of *ariviyai airam*, and several quiz programmes cater to this thirst for science knowledge. Especially noteworthy under this head is the national programme of science quiz 'Quest' relayed from Calcutta.

There are several quiz programmes, both at the national and local network, on geography, history, general knowledge, literature, science and mathematics. Some of these programmes are *mathemagic*, *What's the Good Word*, *Know India*, *Tamil Quiz*, etc.

The popularity of these programmes may be illustrated from the conclusions of a survey of tv viewers' comments. This study was conducted on mostly college students of Madras metropolis. The "Feedback received from the respondents of a survey conducted by four college students shows that viewers of Madras Doordarshan would like more quiz programmes, more national and international news, emphasis on educational topics and better presentation".<sup>4</sup>

The daily programme for women (*Manai matchi*) and the weekly saturday women's programme on the national network contain good deal of educational ingredients such as cooking, preparation of nutritious meals, fruit preservation, home economics, legal education and

the modalities of getting legal help for women.

May not be called technically educational but leading to development of moral values are several heart warming programmes in the morning tv. One such is "The Face in the Crowd". These often bring out on the tv screen individuals who have shown exemplary courage and involvement for less privileged fellow men, i.e. the deaf and dumb national athlete who had fought against her severe handicap to carve a niche for herself in the sports world or the motor parts dealer who organises blood donation totally out of consideration for humanity.

Career education is given through several programmes, often in the late night programme focus (i.e. how to join police force, etc.). A very interesting and realistic programme is the national network programme 'Our Bhi Hai Rahen' where an erstwhile filmstar deals with several problems of women and gives out very worthwhile career information. There are also cinematisation of classics of world literature, i.e. Great Expectation by Dickens and Shakespearian Romeo Juliet as also some of short stories of Tagore. These undoubtedly could be called as educative though may not be quite categorised as journalistic.

Form time to time the news reader gives information on education, i.e. discussion of the new education policy in the parliament or government grant for setting up educational institutes and universities, the president inaugurating new universities, etc.

Since educational journalism/reporting is not merely reporting on educational news but 'is infused more and more with the spirit of liberal education entailing larger ends and issues of education's what the television turns but may rightly be called educational journalism. Admitting that tv attempted and did provide effective educational fare to the public in general several critical comments are in order. Even overlooking the superficial nature of educational programme, the time of presentation of these programmes is seriously faulty. The curricular programmes, i.e. Kanpom Karpom nikazhchi for the science experimentations for middle school children, or the ucc programmes for the high school pupils are telecast at a time when none of these groups are around. The beneficiaries of these programmes are a few housewives or some retired peopole who any way are not particularly interested to view these during their lunch or rest hours. The late night programmes of 'focus', quiz contests also cannot be seen by the young people, for whom it would be of immense value. Could the adult programmes of the farmers' education programmes be shifted to a later

night presentation making evening presentation for direct curricular programmes for the school children? Secondly, all educational programmes are very hurried and the time allotted is not sufficient for a good thorough programme. The results of a city survey of viewer's comments mentioned earlier suggest an awareness of, and thirst for, "more educational items on tv". Could tv meet their just and healthy demand?

Thirdly, though several universities are running correspondence courses and distance education in the order of the day, no university has collaborated with the Doordarshan to give part of the lessons through tv.

Whatever are given through tv under adult education or farmer's education remain completely isolated segments of knowledge and have no continuity with any syllabi the open universities had planned.

A newspaper journalist, S. Padmasini, had written recently that "The overall aim (of tv) is to optimise the learning of the individual students—especially the adult learners of correspondence courses. Even satellite instruction is used by the ministry of education. Of course it may be quite costly to all universities, though the ugc has set apart Rs 2 crore for its higher educational tv programmes for one year'. She proceeded to say "Steps have to be taken to promote the educational technological media which is a powerful device for motivation, reinforcement, for developing the power of observation, insight, practical understanding of lessons and reflective thinking" \*

We may endorse her views with a suggestion for starting a second channel for Madras Doordarshan so that more time can be devoted for even better educational programmes. Such a channel dealing exclusively with education may be an answer to the growing demand for more and better educational items which will not cut across the entertainment tv programmes.

Secondly, a link-up of school lessons with the educational programmes may be effected, so that the school teachers can teach with the help of the television programmes in the classes.

A tie-up of correspondence courses and adult education programmes on tv, non-formal education centre's work, with the farmer's and industrial workers' programmes will be highly desirable to get the most out of this media for educational reporting.

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*Educational Telecasts: Research Priorities*

BHABAGRAHI BISWAL.

MASS media like television and radio provide a vital and accessible learning resource for very large numbers of people all over the world. Broadcasts are used as a reliable source of information and advice to help people to adjust with the complexities of day-to-day life. With a view to educating, informing and entertaining the masses, the Government of India introduced to its people the "Electronic Media" during the fifties. In an underdeveloped society like ours it is only proper that an important role should be assigned to media in the campaign for modernisation and economic development, and in a country in which most people are illiterate, the role of the electronic media would be much more important than that of print media. From their earliest years both the AIR and Doordarsan have accepted this role and



several of their programmes have been designed to fulfil this, whether they are intended for the general listener or for specific groups like farmers, women, students, teachers and workers, of the two media, considerable attention has been given to the use of Television for various purposes due to its advantages of wide coverage, uniformity in presentation, exactness of information, etc.

#### PRESENT SITUATION

Allout efforts are being made by the government to put in use technological aids for improving the quality of education. Audio-visual units, film laboratories, educational technology cells have been set up at the Centre and in the States for promoting the use of educational films and projected/non-projected aids

Coming to the specific use of Television in Education, it may be pointed out that the launching of the Indian Satellite and the opening of many new transmitters provided tv coverage to large rural areas. Besides the Central and Regional Doordarsan Centres, CITE, SILTS and EMRCS have started producing programmes for wide range of audience belonging/ primary, secondary and university students. They aim at providing experiences within and outside the classroom that are not readily and sometimes not at all available from other sources, widening the horizons of the children, stimulating their imaginative and creative faculties, encouraging their interest in the world in which they live, its art and literature, its past and present, its science and technology. The aims of the broadcasts are to introduce children to this wider range of experiences, and to enable them to learn more effectively by providing fresh insights into their studies.

#### FUTURE PLANS

The National Policy on Education—1986 sets the following tasks with regard to the media:

- (i) Expand the tv and Radio transmission network to:
  - Provide minimum ETV and Radio programme coverage for identified target groups in all major language zones.
  - Establish Radio stations in teaching Universities/Colleges during the Seventh Plan.
  - Provide a dedicated educational tv channel.
  - Create a dedicated satellite system for educational needs in the long-term.

- (ii) Expansion of in-house programme-production facilities to generate adequate capacity in major Indian languages and in other languages.
- (iii) Development of facilities/organisations for production, duplication and dissemination of curricular support material using no-broadcast methods/graphic teaching aids.
- (iv) Development of training programmes/facilities for manpower generation for educational media.
- (v) Provide Radio receivers in all primary/elementary schools during the seventh plan and tv sets to all schools by 1995.
- (vi) Eliminating elements of consumerism, violence, etc. from media programmes without delay.

#### SOME BASIC ISSUES

For effective functioning, any system should operate with a scientific base, systematic planning and critical experimentation. The system of Educational Television involves personnel of different professional fields like researchers, child clinicians, educators, policy makers, social activists and parents who are concerned with the interaction between the child and the tv. The programmes beamed from this system are received by a large audience belonging to varieties of Cultures scattered over different parts of the country. Such a vital programme should have long-range objectives, planning, organisation and efficient administration. Each of these aspects should be guided by the researches in this specific field and by those in the related fields like communication, technology of broadcasting, etc. Even though programmes are prepared, broadcast and received by the audience, some basic questions remain to be answered. What is the impact of these programmes? Are the objectives behind the network fulfilled? A clear-cut and detailed information about the objectives, adequacy and quality of the programmes is not available at hand. Does planning at the transmitting end take proper care of these basic elements while transmitting the programmes? Do they have expertise in doing the things according to the psychological and educational background of the children? Do they meet the real academic needs of the children? What about students' reactions? How far do they accept or reject the presence of tv in the classroom? What about teachers' reactions? Do the programmes help them to gain new methods and techniques of teaching? Answers to all these questions will be available by making evaluation of the various aspects of the programmes

#### NEED FOR RESEARCH

Considering various elements of Educational Television, it appears that,

in India, this medium of broadcasting has entered education by itself and operates in isolation. The educational authorities and the teachers need to realise the worth of the programmes and consider Television to be an exclusive part of the educational system. Efforts to consolidate and integrate the missing links between the transmitting end and the receiving end should be done through a systematic evaluation of each of the aspects connected with the system, which, in turn, might provide the basic footing for scientific planning, organisation and implementation.

Any system, in terms of its attainment of pre-set objectives, should start with a research-base. Educational television when looked at in relation to instructional situation, involves various components like teacher, students, instructional aids, instructional techniques, etc. To enable the ETV to attain its desired objectives, study of the existing system, in terms of the needs of the audience, finding the gaps, if any, and organising them systematically to function meaningfully, researches are very much essential.

#### RESEARCHES DONE ON ETV

A large number of studies have been conducted in various developed countries on educational television but in India, a good number of researchers have not been attracted to conduct studies on various aspects. Moreover, the studies done are confined to a few universities and research institutions. The findings of the studies, Dewan (1966), Roy (1974), Mohanty (1986), Saha (1972), Aghi (1977), Agrawalla (1978), SAC (1979), Kanade (1982), Samant (1983), Seth (1983), CIET (1983; 1984) show that:

There is no significant effect on cognitive clarity on students through tv lessons.

Assimilation and utilisation bases were the most affected.

Absence of proper planning, pre- and post-telcast activities, supply of support material have been noticed throughout.

A close look at various research findings of the studies conducted so far, reveals that the co-operation between the broadcaster and the researchers does not have a place in deciding policies on Television programmes. There exists a positive attitude of teachers, parents and community at large to the medium. Teachers feel themselves sufficiently competent in production and direction of educational television programmes.

### NEEDED RESEARCH

Taking into consideration the cultural background and the future needs of the clientele, research studies may be undertaken in the following areas:

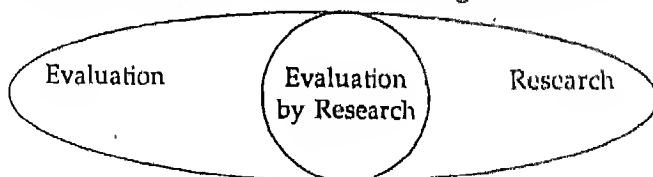
- (1) Relative effectiveness of educational television.
- (2) Attitude of students towards various elements of educational television, taking into consideration the object, context, subject and situational variables.
- (3) Attitude of teachers towards educational television and its uses.
- (4) Interaction between tv, teacher and student.
- (5) Motivation, interest and attention during television instruction.
- (6) Visualisation of tv instruction.
- (7) Improving and programming tv instruction.
- (8) Context of tv instruction.
- (9) Research into design and implementation.

### DRAWBACK AND PROBLEM OF RESEARCH

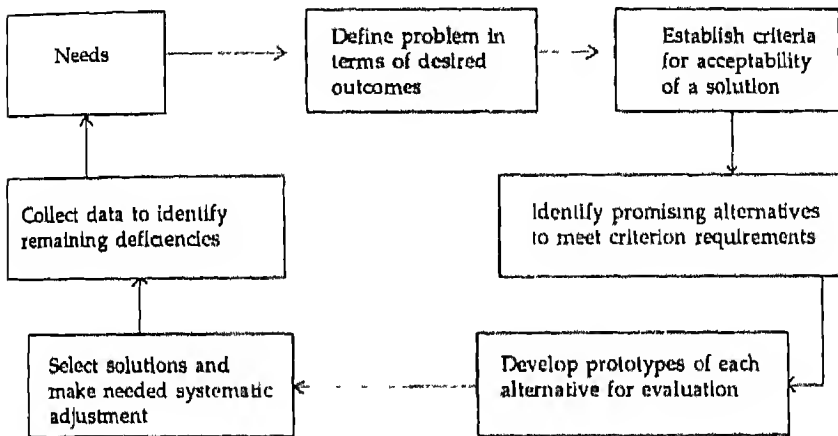
There are difficulties associated with broadcasting. The existing method of research seems to be not suitable for the future development of broadcasting media. The decision-making, consultancy and planning process is itself a complex one and the products, the programmes reflect a long process of planning within the production. Another difficulty is the link between the researcher and the producers. The producers being people from non-teaching department fail to consolidate various teaching-learning components. The range and speed of the programme making is another problem associated with programme research.

### PRIORITY OF RESEARCH

If Indian tv is to meet the well-defined educational objective, it will need the backing of a strong and comprehensive programme of research, and their suitability to the Indian situation. There is also a feedback and evaluation system designed to ensure continuing effectiveness.



Research and Evaluation have a strong bondage between them. A fundamental purpose of evaluation is to produce information which can be used in educational decision-making. Evaluation and research in the field of educational television are the demands of the present situation, which calls for attention of educational media, planners and researchers. Before producing a programme, a series of attempts should be made for the assessment of the needs of the target audience. The following diagram shows the systematic process of need assessment.



Priority should be given for research and evaluation in the following aspects which will indicate the pupil gains in distinctive cognitive areas or examining change in attitudes and interests related to broadcast or examine particular techniques of presentation.

(a) Knowledge, Skills and Interests

- (i) Increase in knowledge
- (ii) Development of comprehension and understanding
- (iii) Learning or extension of a particular skill
- (iv) Area of pupil's interests
- (v) Changes in pupils' attitudes and opinions.

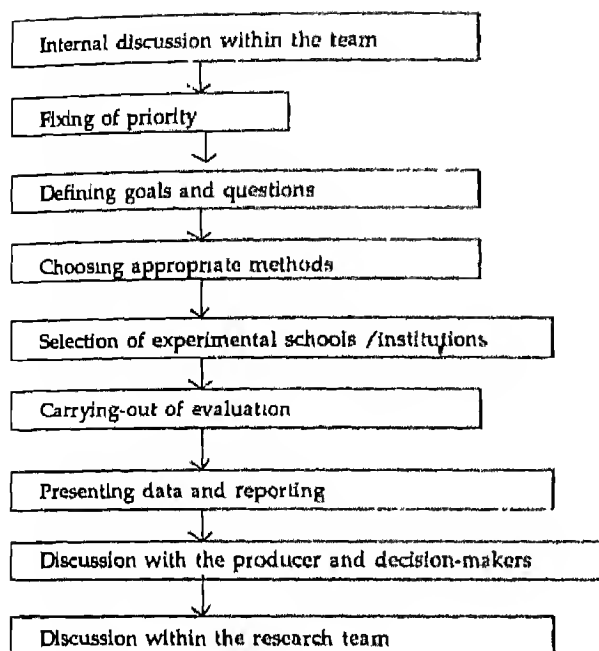
(b) Individual Programme Gains

- (i) Gains to pupils from individual series or programmes within series

- (ii) Gains from individual items in a programme package
  - (iii) Value of differing production methods
  - (iv) Value and effect of techniques, visual discrimination, optimum length of sequences, range and depth of content in relation to pupils' ages and abilities.
- (c) Individual Pupils' Gains
- (i) Differences in knowledge
  - (ii) Skills and ability between differing groups of pupils
  - (iii) Differentiated by age, ability and maturity.
- (d) Utilisation in Schools
- (i) Value of varied approaches to the material broadcast
  - (ii) VCR/VTR repeated transmissions and recordings, etc
  - (iii) Utilisation in relation to classroom variables.
- (e) Teachers' Attitudes
- (i) What are the needs and objectives of the teachers who use school broadcasts?
  - (ii) How can these objectives best be met?
  - (iii) In what ways are broadcasts integrated with school, class or individual work?
  - (iv) What in teachers' views are the most effective programmes, and what are the most effective patterns of programme use?
  - (v) What are the factors influencing the teacher choice of programmes?
  - (vi) What are the particular strengths and weaknesses seen by the teachers in broadcasting?

#### DESIGN OF RESEARCH

Research may be conducted with team approach. The team should consist of representatives from teachers, producers, parents and researchers. The following systematic steps would form the design of research:



#### CONCLUSION

Electronic media open a flood-gate of technological assistance in improving the teaching-learning process. This is an advanced means to provide variety and novelty in the method of imparting training on various subjects. With the advancement of various electronic techniques, nothing is impossible for the media to convey through it. The media used with real planning efforts could change the entire gambit of the teaching-learning process. Educational administrators, educational experts, programme designers, programme producers, teachers, students and researchers are all important links in the implementation of various strategies. Keeping in view the utility of educational television in the country's development, all concerned should come forward to give a big hand to this magic box which acts as an agent of change in social status.



*Educational Broadcast — Research  
Trends, Potentials and Priorities*

V.L. DHARURKAR

**B**ROADCASTING has been described as fifth estate in modern democracies and it has a very important role to play in a developing country like India. the fundamental importance of communication infrastructures can be noted in their essential relevance in socio-economic development of all communities.<sup>1</sup> Especially in a country like India, the role and relevance of broadcast journalism lies in the process of education through mass-communication media. It is now high time that we assesses our educational broadcasting research in order to reshape its nature and status on more broader levels, both qualitatively and quantitatively. Here an attempt is made to present an in-depth review and analysis of educational broadcasting research. This would facilitate understanding of the key thrust areas in educational broadcasting research. Such a study can stimulate accelerated development of educational communication in India.

**OBJECTIVES**

The following can be enlisted as objectives of this study:

1. To take an overview of educational broadcasting research.
2. To observe current trends in educational broadcasting research
3. To explore potential thrust areas of research.
4. To suggest priority issues and themes for educational broadcasting research.

In order to fulfil these objectives an exploration of published work is made here to pin-point the problems in educational research. It has been pointed that one of the primary aims of radio and television in India is education of the masses.<sup>2</sup> The present paper is a sincere effort to evaluate this role.

**METHODOLOGY**

In our educational broadcasting research mostly audience research



and content analysis methods are tested, but more newer and advanced methods of research can be applied to this type of research.

Audience research has been attempted in India since the 1940's. Mehra Masani has observed that AIR started audience research in 1946. Listeners Research Officers were appointed at the stations to study listening habits, opinions and tastes. Techniques of research suited to Indian conditions were tried out and adopted and the procedure was standardised to provide a uniform method of collecting data in different parts of this country<sup>1</sup>. In spite of all these efforts there is a need to strengthen this official research by a more balanced exploration through academic research. Indian universities and research institutes can play an important role in this regard.

The efforts made by the Information and Broadcasting Ministry's audience research have witnessed considerable attraction towards communication research. As pointed by Mehra Masani, a number of surveys were conducted and information was compiled on such questions as composition of listening groups, average size of the listening groups, their educational level, average size of the listening family, reactions to news bulletins, talks, plays, music and other types of programmes.<sup>2</sup> In spite of all these efforts Indian broadcasting research has a long way to go.

Feedback assessment is a phenomenon that needs more careful probing. It has been pointed that in 1978 AIR received around 1,87,79,211 letters from listeners to Home Service and 3,41,567 to the External Service.<sup>3</sup> But these efforts must be further evaluated by adopting new research methods. The Indian Institute of Mass Communication has also conducted research in this aspect. The listeners studies conducted by M.J.S. Yadava are worth noting. He has attempted to highlight the effective role of broadcasting in agricultural extension and rural change.<sup>4</sup>

The Indian Space Research Organisation (ISRO) has also set up its own audio-visual instruction division to plan and probe programmes according to schedule. It is very interesting to note that SITE, Satellite Instructional Television Experiment (1975), had two-fold aspects, one was to make school more interesting and so reduce the dropout rate, and the other was to improve children's basic concepts and skills, promote aesthetic sensitivity, instil habits of healthy living, bring about awareness of modernisation of life and society.<sup>5</sup> It is interesting to note that these goals cannot be tested unless new methods of communication research are evolved and adopted.

The evaluation report published by the ISRO in two volumes presents

a graphic analysis of Indian ETV. This social evaluation report has pinpointed that unless circumstances are changed so that parents do not have to make use of child labour for economic reasons. TV in schools is not going to affect enrolment or the dropout rate.<sup>8</sup> Thus the research problems in Indian educational broadcasting became more delicate due to critical sociological problems in a plural society.

Prof. L.N. Gokhale has conducted an interesting comparative study of ETV in India and Japan.<sup>9</sup> This attempt highlights the useful recommendations being suitable to Asian conditions. In this connection, it has been suggested by Prof. John A. Lint that a third world model must be evolved in the communication development process. However, to support Indian communication research, there is a need to adopt new methods of scientific social research, viz. Interview Recall, Telephonic Recall, Diary Recall, both Telephonic and Diary Recall Taperecorders, Interview Schedules.<sup>10</sup> Audience Research must be cross-checked by using content analysis and comparative studies in Asian and African conditions. The use of folk, traditional folk medium in electronic media can be suggested as a remedy to the communication gaps prevailing in the third world.<sup>11</sup>

#### POTENTIAL THRUST AREAS OF EBR.

The following themes can be suggested as potential thrust areas of educational broadcasting research (EBR) in India:

##### (1) *School Broadcasting*

In spite of studies conducted by S.K. Mohethy, there is much scope to study the role and relevance of educational broadcasting in India. This would be certainly useful for improving standards of school broadcasting programmes. The relevant use of the programme schedules can be assessed by conducting pre- and post-telecast effect.

##### (2) *ETV in Higher Education*

The UCC programmes such as contry-wide classroom can be properly assessed and evaluated to make them more suitable to the Indian conditions. The programme content, oral delivery and graphics can be assessed for further improvement. This is a virgin field for research.

### (3) *Comparative Study*

More interesting comparative studies can be conducted to assess educational broadcast programmes in South Asian countries. SARC platform can be used for preparing a common model. African countries also can be studied in this light. This would evolve a third world model.

### (4) *Co-ordination Research*

There is a need to co-ordinate radio and television educational programmes, both leading to common effect. The changing profile of Indian education must be reflected in these programme schedules. Co-ordination between these two potent media can be fruitful in the propagation of new values as highlighted in New Education Policy.

### (5) *Evolving Educational Media Criticism*

As educational broadcasting is growing, the process coverage is also growing but the press content on educational broadcasting is generally anti-electronic. However, there is a need for proper co-ordination and understanding of educational programmes.

### (6) *Fusion of Folk and Electronic Media*

There is a need for the fusion of traditional folk media and electronic media to improve the effect of educational programmes.

### (7) *Indian Character and ETV*

As pointed by the Joshi Committee report, the poor working women class is a neglected half in our broadcasting. Therefore, special efforts must be made for the educational development of the poor and downtrodden class. More relevant programmes suitable to Indian conditions may be evolved.<sup>12</sup>

### KEY ISSUES IN RESEARCH

The following can be listed as the key issues related to our educational broadcasting research:

1. A study of educational broadcasting criticism being published in Indian newspapers and journals.
2. A study of the relevance of educational broadcasting research to increase the effectivity of the educational programmes.

3. A Cross-study of tv, Film, vdo and Folk Media to correlate entertainment ad education and to avoid media conflict for preparing proper educational atmosphere.
4. A critical study of the broadcasting Journals in India like 'Akashwani' to strengthen their roofs. To study other journals like vdo and tv world for creating educational awareness.
5. To achieve excellence in production and content, a project to study various models to be evolved out of furore of electronic and folk media.

### CONCLUSION

All these media problems and results can be testified to the educational media processing. These efforts would be further useful for enhancing standards of educational Radio and tv schedules. Further, better production and working models can be suggested to be more suitable to Indian conditions. At present the percentage of traditional folk media in educational broadcasting is only 3.3. This can be further taken ahead. The educational effects of ETV can be judged more scientifically by involving both teaching community and masses at large can change the world of Indian educational communication if properly planned conceptual and applied research is involved. To arrive at a sharp focus, it is clear that fine treatment and tuning is needed with the specific purpose to improve standards in Indian language broadcasts. The role of folk media is more relevant in this context for the changing profile of Indian broadcasting research.

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## *Research Possibilities in Educational Journalism*

T.S. THIRUMALAI VELU

**E**ducational journalism, though not a new subject, has gained new meaning and new status regarding its origin, growth and development through the NCERT's educational journalism workshops which are being conducted right from 1985 till date in all parts of the country. In this context, its importance in the field of journalism and education cannot be underestimated. It is a vast area. Its worth can be measured and scope expanded only when sustained research studies are carried out. Such research studies alone can make educational journalism enriched and resourceful.

Research is an independent study. It encourages us to read critically a particular area of scholarly pursuits and select from available materials something new. Research marshals our thoughts on a topic and make us to communicate our thoughts through the presentation of evidence which we have sifted and evaluated to arrive at certain conclusions. Research is expected to make original contribution to knowledge. It represents the culmination of a substantial piece of original work over a period of time.

The word "Research" literally means any investigation which is undertaken in order to discover new facts. The new facts may be additional information which is contributed to the area of investigation. Since educational journalism encompasses an area of journalism and education; and journalism in education, research potential in it is vast and research studies if carried out will be truly rewarding. The research findings will open up new areas which will ensure progress and expansion in the field.

How to make research work in educational journalism? Are there possibilities for research in this area? What are the resources for research studies? What is reorienting content, manner, method, management and process of research in educational journalism?

The major resources for research in educational journalism are the systems and structures (Status) of all the journals published under the classification of "Education", at the regional, national and international

levels. A meaningful assessment of them all (if assessment is taken to mean research) will not only help us to discover their wants and superfluities but also will provide us a chance to discern the tremendous possibilities for research in educational journalism and make it work in the field. Further, it will throw light on the content-oriented nature, manner, method and management of all existing educational journals in the world.

Besides, research in educational journalism is needed when we are not satisfied with the normal requirements of the existing journals and when we want to explore more in order to compete with other media such as photo journalism, audio and video mechanism. Research is a must if we want to recoup all our possible resources in the field so that the know-how of the subject is thoroughly investigated. Above all, research will temper the practicabilities and capabilities of the available resources in order to make them serve the day-to-day needs of journalism in education.

The true motive for research in educational journalism arises out of a scholar's intention to:

1. clarify his doubts regarding the area of interest,
2. pursue a new idea which arises when a scholar probes deep into the field of specialization, and
3. expand the scope and resources for the field of his specialization in order to discover whether they are possible or not.

#### RESEARCH POTENTIALITIES IN EDUCATIONAL JOURNALISM

Any new idea in the field of educational journalism and the status study may provide topics or problems for research in educational journalism. Those topics or problems which have wider interest and which have the possibilities for analysis and to which solutions may be found, can be documented. The problems or topics which need investigation may also be found from the following potential sources:

1. A well-equipped research department in educational journalism with experts both in the field of education and journalism who can act as research guides.
2. A well-equipped library with books on education and journalism. Periodicals in the subjects which are both local and foreign.
3. Research indices or a catalogue of all the possible research areas to be covered and research studies that have been already done.
4. A full-fledged dictionary of journalism vocabulary.

5. A current literature about the latest trends in educational journalism and research method.
6. A list of specific problem areas which need immediate attention and a resume of possible solutions for them.
7. Books of accepted authorities in the field as referencing materials. Reference libraries with referencing rooms and note-card facilities.
8. A good library catalogue with proper and adequate classifications (e.g. Dewey Classification).
9. A journalism laboratory with hard and software facilities in order to enlighten the research scholars in the latest trends in journalism and in education and in any other related field. In addition to these hardware facilities, Duplicating and computer typing machines must be made available within the Campus of the research department.

#### TYPE OF RESEARCH STUDY NEEDED FOR EDUCATIONAL JOURNALISM

Research studies in general can be grouped into two types. They are (1) Experimental or Empirical, and (2) Analytical or Interpretative.

The first type is suitable for scientific research studies and the second type is meant for arts and humanities.

Journals as print media act in general as a liaison between the society and the readers. Expert journalists reflect through this media the status, attitude and psychology of the people. Similarly, educational journalism acts as a liaison between education, instruments of education and society. In other words, it deals with the teaching-learning processes, creative and critical talents, institutional requirements, student psychology, attitude of parents and finally political and governmental involvement in the field of education.

Therefore, when research studies are carried out in educational journalism in print media only, they fall under the Analytical type. On the other hand, when research studies are carried out on the behavioural factors of the subjects (people) who react to the print media, they fall under the Experimental-cum-Analytical type. In other words, this sort of research study involves sampling processes and laboratory testing as it deals with the psychic factors and attitude variations of the readers, writers and reporters on education.

## RESEARCH DESIGN

The word "Design" has been derived from the Latin word "Designare" which means "to mark out". It may mean a developed plan or scheme for a project. It may also mean the minimum requirements for a structure.

Design acts as the pattern for making a product. It is both a form and a style derived from a principle. A good design evokes greater taste for research. The basic elements of a good design are:

1. Line of thinking over a problem area.
2. Consultation of experts or expertise in the field of specialization.
3. Quality, objectivity, validity and reliability of the design which is going to be used in the research study.
4. Area of design application.
5. Fixation of subjects, samples, experiments or models for a design.

In research study, design means procedures, methods, plans or outlines with which data are approached. It may mean systematic approach to investigate a problem in question. It indicates which should be approached first and through what steps or methods.

It may also mean a chronological or logical approach to solve a problem. It decides the feasibility of the study. If the design becomes wrong, the whole study may become wrong. Such a study may be criticised on the ground of inappropriate design.

Design in research study varies according to the nature of the study and the subject area. The variations can be divided into two broader groups. They are:

1. Experimental Design
2. Analytical Design

However, attention must be paid to the following common factors before the design is fixed:

1. Selection of the problem.
2. Statement of the hypothesis.
3. Statement of assumptions.
4. Statement of the limitations of the study.
5. Definition of terms.
6. Fixation and appropriateness of research design.
7. Description of population and samples.
8. Control of error.
9. Reliability and validity.



Once these common factors to the research design are fixed, research procedure is stated and followed. Regarding the appropriateness of the research design, the experimental research design demands statements to be made clearly to test the hypothesis through statistical methods. On the other hand, the analytical type of research design demands a clear description of the research method which is used to locate the data only.

#### BASIC FACTORS FOR A RESEARCH DESIGN

The rudiments for an experimental type of research designs are:

1. Fixation of samples (applicable to behavioural science studies research also) or fixation of the type of experiments with area-wise classification.
2. Selection of samples.
3. Administration of tools to samples.
4. Collection of data
5. Data processing.
6. Data analysis
7. Hypothetical interpretation.
8. Research findings.

Similarly, the rudiments for an analytical type of research studies are:

1. Fixation of source materials through problem areas.
2. Preparation of a working bibliography.
3. Hypothetical statement and its validity and reliability.
4. Stacking the note cards into piles and classifying them according to the major and minor points and also according to the supporting or opposing points.
5. Working on the source materials and taking down of points in the note cards.
6. Further classification of the note cards according to the chapter-wise requirements of the points.
7. Processing the data noted in the cards and verifying the hypothesis.
8. Analysis and interpretation.

#### RESEARCH DESIGN FOR EDUCATIONAL JOURNALISM RESEARCH STUDIES

As stated earlier, if research studies in educational journalism are carried out in print media, the research design to be followed may be the research design meant for analytical type of research studies.

- Similarly, if the research study is carried out with regard to the attitude variations and psychological factors of the readers, writers and reporters on education, the research design to be followed may be the research design meant for the experimental type of research studies.

#### RESEARCH MODEL.

The word "Model" literally means the practical application of a principle on a problem. It may mean the device of a theoretical model.

Research model in educational journalism research may mean the thesis of a parallel research study which has already been completed and in which design and model for review may be found.

Besides, a full-fledged research department with research scholars and experts in both journalism and education (in all problem areas of educational journalism) may throw light on good research models. Research indices or up-to-date cataloguing of research theses in educational journalism will facilitate scholars to choose the models which may be suitable for their research studies. This will also enable scholars to carry out research replications (verifying the findings of a research thesis in different categories of samples and atmospheres). In short, a review of all the research studies (theses) may throw more light on research designs and models in educational journalism. To illustrate this point, the following research model is furnished:

- |                              |    |  |
|------------------------------|----|--|
| 1. Research Area             | .. | Nature of Educational News   |
| 2. Field of Specialization   | .. | Newspaper/Radio/tv reporting on education along with other kinds of news.  |
| 3. Research Problem          | .. | The status given to educational news coverage in English dailies in India compared with other kinds of news.   |
| 4. Review of Related Studies | .. | Are there similar studies which are done with regard to vernacular dailies? If yes, then they may be taken to be the models. If not, then, this study is going to be a model for future studies. |
| 5. Preliminary Investigation | .. | Names of all the English dailies in India are collected and copies   |

- in each, on any date in a month or a day, may be scrutinized to find out whether there is educational news coverage or not. If there is adequate educational news coverage in each daily, there is scope for the study.
6. Statement of the Problem .. Once the scope of the study is ascertained, the topic or the problem may be stated suitably
- 7 Statement of Hypothesis : The educational news coverage is (a) adequate, (b) inadequate (c) suitable, and (d)unsuitable.

After stating the hypothesis, the following questions are asked:

1. Is the problem interesting to the research scholar?
2. Is the study feasible and useful?
3. Is the problem significant?
4. Are there adequate supervisory staff or guides?
5. Are there specialists in the particular area so that the scholar may seek their guidance?
6. What will be the duration of the research?
7. Are there equipments or appliances that are easily available for the study?
8. Are all the subjects for experimentation easily available in one place or easily accessible?
9. Are there good libraries with easy accessibility for study facilities and referencing materials?

#### RESEARCH TOOLS

Since the study is based on investigation, analysis and interpretation in the line of a conceptual framework regarding the standard to be maintained in publishing educational news is arrived at, and thus conceptual framework becomes the tool for the research study. The conceptual framework and the design for the model study may be as follows:

1. An investigation into the educational news published in English dailies in India in any one month.
2. Analysis and interpretation of the news on the basis of the standards prescribed for educational news which are published in dailies.

### RESEARCH PROCEDURE OR RESEARCH METHOD

The data collected in the investigation are tabulated in the following manner:

1. Serial Number.
2. Name and date of the daily.
3. Total number of columns in the daily.
4. Total number of columns allotted to educational news service.
5. Percentage of educational news columns found in the dailies.
6. Nature of the educational news.
7. Treatment of the educational news such as adequate/ inadequate/ unsuitable/suitable.

The data so collected and analysed are interpreted in terms of the following points:

1. Quantity and quality of the news published.
2. Their publication-worthiness.
3. News-room style.
4. Whether useful to the cause of education and its promotion.

### RESEARCH ANALYSIS

The findings are tested through statistical computation and the research report is prepared. To sum up, the following research format makes the research design clear which is the basis for a research model.

1. Planning the research study (General design)
2. Planning the research technique (Specific design)

This may be divided into :

- (a) Experimental design.
  - (b) Experimental-cum-analytical design.
  - (c) Analytical design.
3. Preparation of the thesis.

The gamut of research study from points 1. to 3 constitutes the Research Model.

In short, a research design is nothing but a complete plan drawn in words and a research model is the final product of a research study. It is, in fact, a thesis after evaluation only and it is not an unfinished research work.

Besides, suitable research designs and models may be evolved for the following research study areas in educational journalism:

1. Comparative and contrastive studies among educational journals in India and abroad.

2. Content study and status study in order to assess the quality of journals on education in India and abroad.
3. News and features pattern studies on educational journals in India.
4. Manner and methods of publishing educational news in journals in India.
5. Systems and structures of educational journals in India.
6. Public relations and public reactions to educational journals in India.
7. Quality study of periodicity-wise educational news in journals in India.
8. Content study of periodicity-wise educational journals in India.
9. Content analysis of regional or vernacular educational journals in India.
10. News room and editorial styles of educational journals in India.
11. Appropriateness of national and international press laws on educational journals.

#### CONCLUSION

From the above discussion, it is evident that there are commendable resources for research in educational journalism if research study in the field is given impetus. Besides, the meaning the research designs and research models as we have seen above with appropriate illustrations clearly indicates the fact that they are backbones to research studies in this field. Their usefulness in application will be felt only when the state of research studies in educational journalism is strengthened and its present pace expedited.

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## Book Reviews

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### Population Planning

**Population Planning in India: Policy Issues and Research Priorities**  
Ashish Bose and P.B. Desai (Eds.), B.R. Publishing Corporation, Delhi, 1989

**T**HIS publication is the outcome of a seminar held in New Delhi in February 1989 under the aegis of the Indian Association for the Study of Population (IASP). In the seminar well-known demographers, researchers and administrators presented papers on emerging issues, new initiatives and research priorities in the area of population. This book has been edited by two eminent demographers, Professor Ashish Bose and Professor P.B. Desai.

The publication begins with an overview of Professor Bose, grouping 46 papers under new issues; data utilization; teaching, training and research; data base; population projections; fertility and family planning. The book makes an attempt in the direction of initiating a dialogue between individual scholars working in the field of population and policy-makers who prepare plans at the highest level of government. It also takes into account the population researches to have a

critical view on optimising the returns.

Tracing the evolution of international concerns with population research, Chesterland (*Needs and Priorities in Population Research*) observes a shift from 'traditional topics of demography to more pressing issues—which may be called as 'intervention-inputs' (e.g. development, environment, status of women, etc.) in the field of population. To be more precise, these days' scholars do not view population as an isolated factor but go for studying mutual impacts: such as the impact of population on urbanisation and, at the same time, the impact of urbanisation on population. Although this is a healthy sign, these researches need to prove a difficult hypothesis rather than discussing the known facts. As the resources are limited, Chesterland suggests more meaningful researches unfolding hidden facts rather than discovering loose linkages.

Although Chesterland appears to claim giving new directions in the field of population research, many workers with long association in the field (including the present reviewer) know that in 1975 the Family Planning Foundation published three volumes, out of which one was: *Demography : A Status of Population Research in India*, Volume II, by S.P. Jain (Tata Mc-Graw Hill Publishing Company, New Delhi, 1975). This was a much more detailed study of several issues with empirical data which Chesterland claims as new directions.

Prof. P.B. Desai (*Issues in Population Research*) advocates for research on the family as a social institution. He feels that the study of social institutions is a neglected topic and that it gets little attention in scholarly papers. According to Prof. Desai, most demographers are expert in statistics and demography, they lack interest in social sciences and thus research findings are not fully utilised. It will be difficult to agree or disagree with Prof. Desai as he puts forward no empirical evidence in this regard. However, the Institute of Economic Growth had many demographers starting way back from late Dr S.N. Aggarwal (of Allahabad University) who were first-rate social scientists. Even Prof. Bose, the co-editor of this book, is a distinguished demographer and has orientation in Economics. He uses his population research findings in solving many socio-economic problems where intervention of population is needed.

There are 11 papers in the section dealing with Teaching, Training and Research in Demography. Except one or two papers, all are

descriptive in nature. The authors are attached to different demographic institutions and they have narrated the experiences of their own institutions. For instance, M.K. Premi (Teaching of Demography in India) traces the history of teaching demography from Allahabad University in 1930 and with a very brief description of 45 years, starts describing the status position of the Centre for the Studies of Regional Development of JNU to which he is attached. This whole section would have become more meaningful if the authors had narrated the research findings of their institutes in solving the population problem.

There are 16 papers directly related to demographic data base. In the past 40 years many data systems have emerged to meet the different information demands. The papers have suggested improvement in the civil and sample registration systems. Also, arguments have been advanced for better population quality data needed for planning. Unfortunately, none of the papers has looked towards the pressing needs of the data collector, i.e. the poor investigator.

The section dealing with Population Projections for Short Term and Long Term Planning (Ghosh) falls in line with the traditional classical economists' concern for labour as a factor of production. The author introduces in his model a logistic function for population size varying with per capita income. Such a function assumes that there is an automatic population stabilization in the long run. He seems to be in great agreement with the Malthusian argument, as used by Richrado in his *Principles of Economics*, that the natural price of labour is that price which is necessary to enable the labourers to subsist and to perpetuate their race. The difficulty with the Ghosh model is that it does not provide details of age composition, population distribution, etc. that are essential for short-term or long-term planning. Mukerji's paper on Population Projections suggests a new method of projection, taking past trends into consideration with three hypothetically assumed districts in a State. It will be difficult to agree on all the assumptions proposed by Mukerji, but it is a desirable exercise. Mukerji uses the 'difference elimination' method which is widely used these days in formulating projections.

Yadav (India's Urbanisation and Rural-Urban Migration: A Projection) builds up a model on projection for urban population. His projection method seems to be faulty as he suggests 27.79 per cent of urban population by 2001 when the Registrar General's projection is of about 34 per cent. The model even does not fit with the 1981 data which gives 23.70 per cent of urban population. It is, therefore, desir-



able that these models and methods may be carefully examined before making wider application of them.

Another set of five papers are devoted to fertility and family planning. These papers cover familiar grounds and do not tell much except the analysis from the new group of data. The data taken are sometimes actual and sometimes hypothetical, hence they do not lead to new grounds.

The last paper by Prof. Bose on *In Search of a New Strategy for Family Planning in India* puts forward the concept of sustainable targets. One can sympathise with the concern for improving the various activities controlling population, while maintaining the dignity and status of women. However, it will be difficult to understand that women's organisations can take up the burden of these activities. Moreover, effective women's organisations are mostly in urban areas but a great part of our population live in rural areas.

Of late, discussion on population has become everybody's affair. There are issues which have been very often repeated, discussed, and rediscussed. In the name of population many loose innovations have also developed. But the present publication falls in the group of sensible literature and is a worthwhile reading for the workers in the field.

RAMESH CHANDRA

## Language Learning

### Three Language Formula—An Educational Problem

Santosh Aggarwal, Gian Publishing House, New Delhi, 1991, pp. 300, Rs 235.00

**L**ANGUAGE is the foundation of all learning. Hence, planning for teaching languages, especially at school level, demands not only a scholarly but psychological approach too. The three-language formula

is an official policy of the Government of India, which was evolved after 1947. It provides for a study of a modern Indian language, preferably one of the southern languages, apart from Hindi and English, in the Hindi-speaking states and Hindi along with a regional language and English in the non-Hindi-speaking states.

The students, the teachers and the public men are directly or indirectly affected by this language policy of the Government, especially when the curriculum is being loaded by the advanced scientific subjects in this fast-moving world of today. Moreover, 15 national languages have been given equal status in the Constitution of India. Besides, the knowledge of one of the international languages has also become essential. The students are compelled to learn whatever languages are being provided by the educational institutions. If the future of the mother tongue and the official language of our country remains dark where lies the future of the language of the scriptures—our cultural heritage? The learning of a common language as a great unifying force for integrating the different states is another requirement. Moreover, the autonomy given to the states in the field of education creates another problem. The author has made an effort to highlight such burning issues in the book.

The present book based on an empirical study is presented in two parts. Its first part includes a historical survey of the languages used and learnt in different periods in India, comprising Vedic, Medieval, British and Independence era. The second part is focused on the present position of language teaching and learning in schools. For this, the investigator selected six such senior secondary schools of the Union Territory of Delhi where teaching was done through minority languages or mother tongue and which provided facilities for learning the maximum number of languages listed in the VIII Schedule of the Constitution of India. Three hundred students of Class X, fifty from each school, constituted the sample of the study. Three tools—a questionnaire, an opinionnaire and an interview schedule—were developed to collect information regarding the three-language policy from the students, language teachers and different public men. The study revealed that though the safeguards in the Indian Constitution are given to the language minorities, yet in practice, in most of the linguistic minority schools very little provisions were made to give instruction in the mother tongue of the students even at the primary level. One more language was added at the lower secondary level. Even at the secondary level, three languages, instead of two, were being

taught. It is significant to note that while calculating the marks for promotion, one language was dropped at all the levels of school education. Thus, the importance of learning the additional language was not of any significance to the students. Even failing in Hindi in Class VII or VIII did not stop any promotion to the next higher class.

The students in all the mother tongue groups felt difficulties in acquiring the four-language skills simultaneously in the three languages. English as a second language was difficult for them, but the mother tongue was also not too easy to learn and use. Some of the non-Hindi-speaking students opted for classical language—Sanskrit as the third language. It appeared to be a difficult language for them because of its limited use. Sanskrit had been opted by a number of science students and they did not find it more difficult than English—a language more in use. The other regional languages learnt by the sample group were found to be Hindi and Urdu, and they acquired four linguistic skills in these languages satisfactorily. The students opted for French/Russian/German as the third language in lieu of the regional language which they considered difficult and could not develop all the four skills in any of these languages due to lack of proper environment for learning them.

Majority of students opined that learning of three languages did not constitute a burden for them, rather it helped them in their studies. Intellectuals, journalists, professionals and language teachers rated the three-language formula high as it would develop academic standard, promote mobility, develop communication, promote national integration and enhance occupational opportunities.

It is not proper to generalise the status of languages in the country on the basis of such a small study. Still sufficient understanding has emerged regarding the status of minority languages in the Hindi-speaking states.

(MRS) R.K. CHOPRA

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# **Indian Educational Review**

**A RESEARCH JOURNAL**

**Vol. XXVII No. 3 July 1992**



**राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्  
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING**

## INDIAN EDUCATIONAL REVIEW

- **PURPOSE** *Indian Educational Review* is published quarterly in January, April July and October, by the National Council of Educational Research and Training, New Delhi. The purpose of this journal is to provide a medium for dissemination of educational research and exchange of experience among research workers, scholars, teachers and others interested in educational research and related fields and professions
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The emphasis is on categories 2, 3, 4 and 5. Ordinarily, a paper is not accepted if it has appeared in print or in any form

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## Prolegomena to Research in Philosophy of Education

PETER M. COLLINS  
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"EDUCATIONAL RESEARCH" is an extremely intricate phenomenon. It signifies systematic investigation into the process and product of "education," a highly controversial area of human life. The complexities of such research are indicated, to some extent, by the numerous and widely varying methods of seeking knowledge about education, as well as by the need to interrelate and synthesize the principles and conclusions involved. One area of educational research is that associated with philosophy of education.<sup>1</sup> For various reasons, very little attention has been devoted formally to the general nature of research in philosophy of education.<sup>2</sup>

What follows is directed, not to an "engagement in" (or a "doing of") research in philosophy of education, but to an introductory analysis of certain features of

this area of research. Therefore, these comments can be considered prolegomena to active involvement in research in philosophy of education.

The general purpose of this paper is to clarify some fundamental considerations underlying research in philosophy of education. Within this context there are two specific purposes: 1) to note the role of history in research in philosophy of education; and 2) to describe and exemplify the intensely personal character of philosophy (of education) and some implications for research in philosophy of education.

Although no effort will be expended in elaborating and defending the philosophical position assumed here, several characteristics of that stance ought to be mentioned.<sup>3</sup> Those characteristics include: 1) a dualistic theory of reality consistent with Christian principles and, more particularly, 2) a need for the integration of subjective and objective aspects of human cognition,<sup>4</sup> and 3) an analogical concept of knowledge,<sup>5</sup> including educational research.

Philosophy (of education), as approached here, is not merely artistry for its own sake or gaming (even though some may undertake the study of it "for fun"); rather, it is a genuine, authentic search for meaning and truth.<sup>6</sup> The kind(s) of meaning and truth sought depend upon the kind(s) of philosophy (of education) pursued

#### SIGNIFICANCE OF A PHILOSOPHICAL PERSPECTIVE

One of the prevalent facts in recent educational history is the tendency to identify educational research with empirical studies of behaviour relative to the educational process. The general acceptance of this identification in pedagogical circles is so widespread as to render documentation of it relatively superfluous. Evidence of it can be discovered quickly simply by observing the nature of the articles published in the various journals devoted exclusively to research in education.<sup>7</sup> Further substantiation of the same point likely can be attained through noting the orientation of courses concerning educational research,<sup>8</sup> and the (lack of) space devoted to research in philosophy of education in textbooks in educational research.<sup>9</sup>

In light of this trend, given impetus recently by attention to "accountability,"<sup>10</sup> it is understandable that a prominent American educator observes that "In America at least, research cannot yet tell us the difference between a good school and a bad school"—despite the fact that teachers, students and parents can do so.<sup>11</sup> A prime factor associated with this anomaly, he reports, is that decisions concerning a quality of a school entail values, resulting in the fact that these decisions are "necessarily subjective and personal"; "...there is no 'objective' production function of education."<sup>12</sup>

These observations highlight the extraordinary need for philosophical studies in education. First of all, empirical research not only cannot yet determine the fundamental quality of a school; it never will be able to do so. Despite the contentions of some American pragmatists to the contrary,<sup>13</sup> it is clear that the basic worth of a school cannot be ascertained independently of its end, and an end cannot be determined on empirical grounds alone. In the last analysis, judgments prescribing an end of life and/or of education inevitably entail religion and/or theology and/or a philosophy which is "open" to the Transcendent.<sup>14</sup>

Maritain provides an example of this kind of philosophy: it is "the science which by the natural light of reason studies the first causes or highest principles of all things."<sup>15</sup> He insists that "... nobody can do without philosophy, and that, after all, the only way of avoiding the damage wrought by an unconscious belief in a formless and prejudiced philosophy is to develop a philosophy consciously."<sup>16</sup> The areas of philosophy which he finds critical in this context are indicated in his observation that "... the very truth of every knowledge bearing on human conduct implies sound judgment about the ends of human life, that is to say, the actual knowledge of ethical and political philosophy, which in its turn presupposes metaphysics."<sup>17</sup>

Since education (including research into the nature and consequences of that phenomenon) necessarily entails the ends of human life, educators (including educational researchers) inevitably require a certain philosophical awareness.<sup>18</sup> Empirical research, in itself, necessitates choices and hermeneutics which are philosophical. This interpretation of the situation provokes attention to the need for research in philosophy of education, the focal point of this paper.

#### HISTORY OF PHILOSOPHY (OF EDUCATION ) AS "ORGANIZED CONFUSION"

Initiating a formal study of philosophy (of education) can be a hazardous undertaking. Although there are courses and books entitled "Introduction to Philosophy," there really is no "objective" introduction to philosophy,<sup>19</sup> meaning that whoever is doing the introducing (in person or by means of a book or article) is immersed in a limited philosophical perspective. In some real sense, there are as many introductions as there are persons to provide them; they will vary according to the extent that the choices and interpretations of those providing them differ. That philosophical orientations are radically divergent can be detected readily from a glance at history: philosophers reject not only the answers of fellow thinkers, but also their questions. A few examples will illustrate this point.<sup>20</sup>

It has been said (by Alfred North Whitehead, a twentieth-century philosopher) that the whole history of philosophy is a footnote to Plato (427-346 B.C.). At any rate, Plato's influence on the history of ideas and culture is inestimable. He is

noted for having insisted that the material world, which constantly changes, is a mixture of being and non-being and is an object of human "opinion" (seeming knowledge). In the World of Ideas or Forms one discovers the ultimately real, which is the spiritual exemplar for the imperfect shadows in the sensible world. The goals of human living are to gain knowledge of the Good (called the One in the later dialogues), which is the all-inclusive Form, and to conform one's conduct to the standards entailed in that knowledge.

Saint Augustine (354-430 A.D.) gave up a life of dissolution through becoming a follower of Christ, a conversion prompted partially by his study of Neoplatonic philosophy. He tended to agree with aspects of Plato's approach to reality, but believed in the personal Triune God of the New Testament and the Catholic Church. For him, Christ was the Master Teacher, and the wise human being was one who based his life on a fusion of faith in the God of Christianity along with the use of reason. He saw no need to distinguish theology from philosophy.

John Locke (1632-1704), noting some of the discrepancies in modes of thought and conclusions among philosophers (such as those evident in Plato and Saint Augustine), observed that the cause of such disagreements lies in the fact that the human mind is not capable of answering such questions as the ultimate nature of reality, to which previous philosophers had been addressing themselves. He contended that the central philosophical question is, "What are the limits of human reason?" Locke is known, therefore, for having shifted the focal point of philosophy from metaphysics (the study of being) to epistemology (the study of knowledge) and for having concluded that genuine human knowledge consists of that which is attainable through the senses.

Jean Jacques Rousseau (1712-1778) exalted the emotions over reason as a foundation for living a good life. Reason provides some guidance, but the internal feelings offer the source of the fundamental direction of life. One of the large philosophical problems in Rousseau concerns the relationship between the person as individual and as citizen. Religion is merely a natural phenomenon.

John Dewey (1859-1952) insisted that there is only one method of knowing, which is his empirical, problem-solving method. There is but one sure road of access to truth, according to Dewey; *all* knowledge (including that associated with the ethical and the religious dimensions of life) must be ascertained scientifically. He claimed to have gone "beyond agnosticism" (and, therefore, atheism and theism) through the exclusive use of the problem-solving method, which forces one to avoid even raising a question of the existence of a Transcendent Being.

Perhaps foreshadowed, in some sense, by Dewey, A.J. Ayer (1910-) asserts that all meaningful propositions must be traceable (at least in principle) to some empirically observable reality. Prescriptive ethical judgments are considered emotive, and metaphysical and theological principles are relegated to the realm

of the nonsensical. Only scientific propositions are meaningful and can be judged as true or false.

It is evident from these examples that some philosophers tend to specialize in systematically eliminating and ignoring the primary concerns of others in the field. While there is some continuity in the history of philosophy, in that each is reacting to the world and to what earlier and contemporary thinkers have said, the lack of unity may be viewed as baffling (and, perhaps, disillusioning), especially to one wishing to begin the study of philosophy. Obvious difficulties exist in knowing where to start, whom to investigate, and what to accept as true.

Furthermore, serious potential ambiguity lurks even in attempting to relate philosophers and systems of philosophy by grouping them in philosophical movements.<sup>21</sup> One learns quickly that the differences between two philosophers within a (so-called) school of thought can be in some respects greater than between two who are usually associated with two different schools.<sup>22</sup> One basic reason for this confusion is the extraordinarily personal character of a philosophy; no two persons are identical, and neither are their philosophies of life. Among the explanations of this apparent fact seem to be the fallibility and limitations of human awareness, and the richness of reality.<sup>23</sup>

For one who believes in personal Transcendent Being and Divine Revelation (as found in Christianity, for example), awareness of these differences among philosophers and the personal character of philosophy point to the need for religion and theology.<sup>24</sup> Of course, this raises extremely complex questions concerning the relationships between "theology and philosophy, faith and reason, and grace and nature, as well as the meaning of "Christian Philosophy." While these matters constitute pseudo-problems for nonbelievers, they hold a tremendously important place in the history of ideas, and, as noted, are necessary questions for Christians and some others. In the area of our more immediate concern, this suggests the need, from a Christian perspective, for research in what might be referred to as theology-philosophy of education." Here, as well as in philosophy of education, attention to history is essential

#### ROLE OF STUDIES IN HISTORY OF PHILOSOPHY OF EDUCATION

The significance of studies in the history of philosophy of education for research in philosophy of education is not unrelated to the significance of history for any scholarly investigation. However, history has a place in the study of philosophy quite different from its place in the study of some other disciplines due to the nature of philosophical principles. In philosophy one system replaces another in prominence, not merely because philosophers agree that it should on the basis of some apparently incontrovertible empirical evidence (even though

empirical evidence is not unrelated to philosophizing), but primarily because of the limitations and fallibility of human reason, and the richness of reality.

The historical contributions to philosophical truth tend to form aspects of a mosaic which not only possess elements of truth, but also serve as a springboard to renewed philosophizing. Furthermore, there are perennial philosophical questions, even though the scope of concern is altered according to various philosophers. While it is a fact that radical divergences among philosophers can entail denial of the legitimacy of previously pursued questions, all philosophers inquire into meaning in some manner. In addition, there are questions, such as the origin, ultimate nature, and final destiny of the person (which necessarily raise a question of the existence of God) which human beings, by nature, tend to consider. These questions, in fact, hold a prominent place in the history of philosophy; to attempt to answer them today while overlooking this heritage would be foolhardy, indeed.<sup>25</sup>

A more practical dimension of the significance of studies in the history of philosophy can be demonstrated through a consideration of the dialectic of "openness" and "closedness" within the cognitive functioning of the student of philosophy. The former refers to the (more or less) continuing decision of a person to consider philosophical positions other than his own, recognizing, however, that such a decision entails one's own present intellectual posture (closedness), which is employed in choosing intelligently to whom to open oneself, and in deciding whether or not to appropriate that which is discovered.<sup>26</sup> While there is a certain tension between openness and closedness, they are (ideally) carried on simultaneously (usually with a clear emphasis upon one or the other) and in complementary fashion. The complementary feature is seen in that one's closedness is essential to becoming intelligently openminded, and one's openness serves to enable the person to develop his or her own present position (closedness).<sup>27</sup> One important object of this openness for a student of philosophy is the history of philosophy.

These correlatives provoke an awareness of the dualism of past and present, which also must be "balanced" in one's effort to discover the truth in philosophy. Attention to the present obviously is essential to intelligent living because a person must become aware of his own world in order to adapt it to himself and vice versa. However, desirable adjustment requires some kind of concern for the past, if for no other reason than to avoid its mistakes. In philosophy, one's own present perspective in relationship to that of others is a vital dimension of the source of his philosophizing. Consideration of earlier philosophical methods and principles is deemed significant for the reasons indicated above: the elements of truth to be discovered there, the stimulation of renewed philosophical reflection, and the awareness of perennial philosophical questions which naturally preoccupy

human beings.

Again, in regard to past and present, the notion of a complementary "balance" is evident in the context of a certain tension. The tension derives from the fact that past and present are distinct entities, and the same kind and extent of attention cannot be given to both simultaneously. The complementary feature is seen in that one's present intellectual posture is inevitably instrumental in considering philosophies in history, whereas focusing upon the latter seems necessary to the development of one's present philosophical awareness. The need for concern about "balancing" the past and present becomes clear in noting the possibility of overemphasizing either side.<sup>28</sup>

Having observed some features of the significance of studies in the history of philosophy for studies in philosophy, one can extend them to investigations in philosophy of education by viewing this area as an application of philosophical principles and methods to educational matters, which means thinking philosophically about education. What does this mean for research in philosophy of education? Firstly, in a very fundamental and practical sense, attention to the history of philosophy of education seems to be a necessary means to recognizing and establishing the viability of a research topic in philosophy of education. The researcher must become familiar with the historical and contemporary (which is also historical in a sense) literature in the field in order to demonstrate the need for his research, including the fact that it has not been undertaken elsewhere. This requires describing what has been done relative to the topic, what needs to be done, and how the proposed can contribute to what is needed. Secondly, studies in the history of philosophy of education promote the possibility of an enhanced familiarity with methods of philosophizing, one or more of which must be chosen by the researcher for use in his particular project.

In order to achieve both of these results (clarification of an authentic research topic and sufficient familiarity with the use of one or more methods of philosophizing) from studies in the history of philosophy of education, a considerable amount of time and effort is required. That is to say, one ordinarily will not be prepared to engage in this kind of research within a few months or a year after initiating such studies. A strong background in philosophy is preferable in the undergraduate years; furthermore, a prominent dimension of the graduate programme in philosophy of education should consist of courses in philosophy, as such.<sup>29</sup>

#### METHODOLOGY AND ORIGINALITY IN RESEARCH IN PHILOSOPHY OF EDUCATION

There appears to be a strong inclination in the United States today to deemphasize discussion about "method" in reference to research in philosophy

(of education). For example, apparently few, if any, philosophy departments in American colleges and universities offer courses in methods of philosophical research, as such. Doesn't it seem somewhat anomalous that this would be the case in an area so thoroughly devoted to *processes of reflections*?

A discussion of method(s) of philosophizing can be distinguished, but not separated, from a consideration of first principles (starting points) and conclusions. The method is launched on the basis of the starting point and leads to a certain kind of conclusion. The starting point is fruitless without the method and conclusions; the method is inoperative without the starting point and ineffective without the conclusions; and the conclusions are relatively unintelligible unless associated with the starting point and method.<sup>30</sup>

A noteworthy example of a philosopher who examines first principles systematically is Aristotle (384-322 B.C.). He defines intuitive reason as a means of apprehending the undemonstrable principles or axioms on which any science is based. These axioms (or central institutions or assumptions) cannot be proven logically, but our minds, by simple intuition, accept them as obviously true to fact. They constitute the foundations of the possibility of knowledge. Primary among these first principles, according to Aristotle, is the principle of non-contradiction; according to one formulation of it, a thing cannot *be* and *not be* at the same time.<sup>31</sup> While some philosophers may not reflect upon their reflecting in this manner, it appears that in all philosophical systems in the history of ideas there are gratuitous assertions that constitute primordial beliefs (perhaps associated in some way with the temperaments of their authors).<sup>32</sup>

Regardless of the effort of the philosopher to be fully rational and regardless of any achievements in that direction, each philosopher relies fundamentally upon a position which is not (originally, at least) known, but which is *believed*. This primordial intuition is sometimes elaborated or explained; at any rate, it is employed as a starting point for launching one or more methods of thought, which is (or are) utilized in order to attain conclusions. For example, there is some parallel between St. Thomas Aquinas (1225-1274) and Jean Paul Sartre (1905-1980): the former is a theist who demonstrates philosophical implications of a theistic posture, and the latter is an atheist who develops his philosophy by showing the rationality of an atheistic stance.

Two points should be noted: these primordial intuitions or gratuitous beliefs (philosophically speaking) are intensely *personal*, and, along with the methods, they provide the orientations of the various philosophical systems.

A prominent example of the conjunction of a central intuition and a method is found in the philosophy of Rene Descartes (1596-1650). His technique of methodical doubt is a process of systematically doubting everything in order to know with absolute certitude. After exercising universal doubt (as he sees it),



Descartes becomes certain of the proposition, "I doubt, therefore, I am." From there he proceeds to the certain knowledge of the existence of the soul, the existence of God, and the existence of the material world. However, behind the gesture of skepticism with which Descartes presumably initiates his inquiry can be detected an "unbounded faith in reason"; a starting point which is essential to the development of his thought.

The importance of the personal character of an individual's philosophy (of education) scarcely can be overemphasized. This observation does not negate the assertion that there does exist an objective, intelligible order of reality.<sup>33</sup> In relationship to the topic of this paper, however, it does signify that the method(s) of philosophizing is (are) not utilized independently of this personal feature. Therefore, one discovers in the history of philosophy (of education) extremely individualistic conclusions, which, when conjoined with the complexity of reality, help to explain the "organized confusion" reigning in this aspect of the history of ideas. In turn, this seems to render more plausible the tendency to diminish or eliminate formal attention to methods of philosophical research, as such.<sup>34</sup>

Perhaps, it is not inaccurate to look upon courses in the history of philosophy (of education), metaphysics (and education), etc., as efforts to engage in philosophical reflection (in relationship to education), which constitute the modes of research in philosophy (of education). In fact, the study of method in philosophy (of education) appears to call for the immersion of the investigator in a particular mode of philosophy (of education) as a basis for reflecting upon the method(s) employed, due, especially, to the intimate association of first principles, methods, and conclusions. Furthermore, within the context of any method utilized, the correlatives of openness and closedness (as discussed above) tend to function and should be employed in a consciously appropriate fashion.

Thus far in this section, attention has been focused upon methods of philosophizing, as such. While this is an essential element of research in philosophy of education, there is another dimension to be considered. education must be brought into the picture in some manner. This is done in accord with the mode of philosophizing involved. In other words, philosophizing in philosophy of education must be done in relationship to the questions and problems of education, the purposes being : 1) in a descriptive fashion, to analyze and clarify educational language, and 2) in a prescriptive manner, to direct or re-direct the process of education in order to resolve perplexing theoretical and/or practical issues enroute to enhancing the quality of educational relationships and experiences.

The originality of research in philosophy of education can be understood in at least two senses. The first is more typical and refers to discoveries involving principles and/or methods in philosophy, principles in education, or some

combination thereof (in the context of philosophy of education). The second meaning is realized when a new relationship between philosophy and education is discovered, even though the philosophical and educational principles themselves were known previously. In any case, all research in philosophy of education requires first principles and a method (or methods) of philosophizing leading to conclusions somehow involving education.<sup>35</sup>

## SUMMARY AND CONCLUSION

The following summary precedes a final conclusion to these comments on research in philosophy of education. In the opening section, attention is drawn to the fact that this paper is devoted not to an "engagement in" or a "doing of" research in philosophy of education, but to introductory comments *about* research in that field. The general purpose is stated as the clarification of some fundamental considerations underlying research in philosophy of education, with special attention to the role of the history of philosophy of education and to the personal character of philosophizing. The philosophical orientation assumed in formulating these comments is noted, along with the observation that one common feature of philosophizing is the intent to seek truth and meaning.

In the second section ("Significance of a Philosophical Perspective"), the prevalence and difficulty of identifying educational research with empirical investigation are related to the need (in life and in education) for a philosophy open to the Transcendent and (according to a Christian viewpoint, for example) for religion and theology. The importance of a certain philosophical awareness on the part of the educator is noted.

The third section ("History of Philosophy (of Education) as 'Organized confusion' ") is dedicated to explaining and exemplifying the radical divergence among philosophers in the history of thought, and to observing some factors contributing to this state of affairs. Further considerations are noted for the person who believes in the personal Triune God of Christianity and in His Divine Revelation: the reconciliation or harmonizing of grace and nature, faith and reason, and theology and philosophy, and the discernment of the meaning of "Christian philosophy."

The fourth section ("Significance of Studies in History of Philosophy of Education") is intended to show the utility of studies in the history of philosophy of education for the personal development of one's own appreciation of philosophy of education and for doing research in the field. Attention is turned to the dialectic within a person between attitudes of openness and closedness to "others" in history and to the need for balancing the alternatives of self and other, and past and present. Some practical suggestions are offered for employing the history of

philosophy of education (on the basis of a relatively extensive background in philosophy) in defining and carrying out a research project in philosophy of education.

In the fifth and final section ("Methodology and Originality in Research in Philosophy of Education"), "methods of philosophizing" are considered in reference to first principles ("primordial intuitions" or starting points) and conclusions. The intensely personal character of philosophy (which must be viewed in conjunction with a recognition of the existence of an objective, intelligible order of reality) is emphasized and related to some present circumstances pertinent to research methods in philosophy of education. Two modes of relating philosophy to education are noted. Finally, there is an explanation of two meanings of "originality" in philosophy of education, which serve as guides in locating research topics in the field.

In relationship to the following conclusion to these introductory remarks concerning research in philosophy of education, it will be helpful to recall that the importance (and the inevitability?) of philosophy in rendering educational decisions and in carrying on educational research has been stressed. Furthermore, the need for research in philosophy of education, as such, also has been emphasized. Why, then, has such meagre attention been devoted to discussion about research in philosophy of education in pedagogical literature?

Among the factors to which this phenomenon may be attributed are: 1) the prevalent tendency to identify educational research with empirical studies in education, and 2) the personal and elusive character of methodologies in philosophizing. The second factor probably has contributed to the development of the first insofar as the feeling of a need to unify the overwhelmingly pluralistic approaches in philosophy (of education) has been satisfied for some by reducing all knowable reality to the empirical (sensibly observable) as a foundation for verification.

The historical background of the contemporary status of research in philosophy of education is an important and interesting matter, still to be ascertained. While an analysis of that background seems essential to understanding the present situation as fully as possible, two suggestions can be made in its absence. From the perspective of many Christians, for example,<sup>36</sup> philosophy (of education) needs to be re-focused upon the synoptic questions of life and reality (such as Who am I? and What is the purpose of life?) in order to become pertinent and meaningful to more lay persons and professional educators.

Secondly, in this broader context, the relationship between theology and philosophy must be cultivated anew. The implementation of these two recommendations upon a sufficiently widespread basis would provide a foundation for the possibility of more meaningful human living and educational planning,

as well as the possibility of enhanced attention to research in theology—philosophy of education.

## NOTES AND REFERENCES

1. The temptation to refer to research in philosophy of education as a certain *kind* of research should be overcome: not only in education, in general, but also in philosophy of education, more particularly, there are multiple modes of research
2. This statement is not intended to signify that little research has been done in philosophy of education, but that there is little published literature *about* research in philosophy of education, including fundamental assumptions, the methods utilized, and the kinds of conclusions derived. Some of the reasons for this phenomenon are a major concern of this paper
3. The importance of a philosophical posture in commenting about or in "doing" philosophy (of education) or pertinent modes of research is among the significant features of this paper.
4. For a brief commentary on subjectivity and objectivity in philosophy, see Frederick Copleston, S.J., *Contemporary Philosophy. Studies of Logical Positivism and Existentialism* (Westminster, Maryland: The Newman Press, 1966), pp. 127-32.
5. See Jacques Maritain, *The Degrees of Knowledge*, translated under the direction of Gerald B. Phelan (New York: Charles Scribner's Sons, 1959)
6. For a comment in this regard, see I.M. Bochenski, *Contemporary European Philosophy*, translated from the second revised German edition by Donald Nicholl and Karl Aschenbrenner (Berkeley and Los Angeles: University of California Press, 1956), p vi
7. Among these journals are the following: *Research in Higher Education*, *Review of Educational Research*, *The Journal of Educational Research*, *Educational Research*, *Educational Researcher*, *Scandinavian Journal of Educational Research*, *The Alberta Journal of Educational Research*, *Educational Research*, *Educational Research Quarterly*, *The Journal of Research and Development in Education*, *The Durham and Newcastle Research Review*, and *Research in Education*. It also is pertinent and interesting to note, as an example, that in the *Humanist Educator* (the official publication of the Association for Humanist Education, a division of the American Personnel and Guidance Association), articles are arranged in various categories, the two primary ones being "Theory and Position Papers" and "Research," the latter obviously referring to experimental or empirical studies.
8. For example, at the University of South Florida, Tampa, Florida, one of the divisions of the College of Education is titled "Measurement-Research." Among the eleven graduate courses offered in this area (excluding a practicum), all except two are devoted exclusively to one or more of the following: statistical analysis, measurement, computer and data processing, and systems theory and techniques. Not mentioned are non-empirical procedures involved in theology, philosophy, and history.

In the area called "Foundations," there is a course, *Foundations of Educational Research*, which includes (according to the complete description) "major types of educational research, with emphasis upon understanding the experimental method." Another course in this area, *Classics in Educational Research* is directed (according to description) nearly exclusively to empiricists and behaviorists, and to empirical studies of the past. The strong emphasis upon

experimental research in these course descriptions exist despite the fact that the "Foundation" area includes philosophical, social, economic, historical and psychological studies of education. *Accent on learning*. General Catalog of the University of South Florida, 1980-81 (Tampa, Florida: University of South Florida, 1980), pp. 214-16, 222-23.

9. A limited, informal survey has revealed little, if any, attention to research in philosophy of education in these textbooks. One, by way of favorable exception, devotes two-and-one half pages (out of 195 pages) to it — including the following apology: "The research of the philosopher, *insofar as we can stretch some of our elementary definitions of what constitutes research*, involves the systematic synthesis and analysis of the aforementioned documents" (*italics mine*). Rodney W. Skager and Carl Weinberg, *Fundamentals of Educational Research, An Introductory Approach* (Glenview, Illinois, and London: Scott, Foresman and Company, 1971), p. 63.
10. "Accountability" in education seems to be taken generally to signify the need to demonstrate the assumption of educative responsibility by means of *quantifiable* results.
11. Denis P. Doyle, "Public Policy and Private Education," *Phi Delta Kappan*, LXII (September, 1980), 19. (Doyle was a Federal Executive Fellow at the Brookings Institution, Washington, D.C., and was on leave from his position as Assistant Director of the School Finance Division at the National Institute of Education).
12. *Ibid.*, 18.
13. For example, consider the position of Chauncey Wright, one of the earliest predecessors of John Dewey in the pragmatic tradition: "I do not feel so confident about your problem, 'Why do we exist?' . All the ends of life are, I am persuaded, within the sphere of life, and are in the last analysis, or highest generalization, to be found in the preservation, continuance, and increase of life itself, in all its quantities of rank, intensity, and number which exists — 'for what,' do you ask? Why, for nothing, to be sure! Quite gratuitously. Does anyone seriously expect to be answered in any other terms than those in which the question could be rationally framed? 'Are any ends suggested out of the sphere of life itself?' Philip P. Wiener, *Evolution and the Founders of Pragmatism* (Cambridge, Massachusetts: Harvard University Press, 1949), pp. 37-38.
14. While this matter obviously involves philosophical controversies, the position taken here is explained somewhat by the following: "Now, to ask whether human existence has a 'meaning' is presumably to ask whether it fits into any finalistic pattern, and to ask this is much the same thing as to ask whether it has any purpose or end. Is such a question a 'scientific' question, capable of receiving an empirical, nonmetaphysical answer? It can be turned into a scientific question; but then it is no longer the original question. What I mean is this. I might interpret the question as meaning, 'What ends or purposes have different individuals or cultural groups assigned to human existence?' In this case I have a question to which the historian and the sociologist can in principle provide a definite, even if necessarily incomplete, answer. But the question is then not the original question which was asked. For the questioner did not intend to ask, 'What have people thought to be the end or purpose of human existence? Or what ends they have as a matter of historical fact assigned to human life and activity: he intended to ask what is the 'real' purpose of human existence, irrespective of what individuals and groups may have thought about it. And this question may appear to involve an illegitimate use of terms such as 'purpose' and 'end.' And so it does if 'purpose' and 'end' necessarily mean purposes and ends determined by man. For in this case it would be absurd to ask what is the ultimate purpose or end of human existence, apart from and independent of the purposes and ends which human beings have set before themselves. Human existence and human history cannot have a purpose or end in the sense intended unless it is given or fixed 'from outside,' as it were. And it cannot be given or fixed from outside unless

there is a Being capable of determining it. Thus to ask whether human existence has a purpose is to ask whether there is a Being capable of determining such a purpose. It seems to me, therefore, that the question whether human existence has a purpose necessarily implies a reference to the Transcendent. And a question about the Transcendent is not a scientific question. But it does not necessarily follow that it is a pseudo-question, unless one from the start identifies 'real' questions with scientific questions. And though it is open to anyone to recommend this identification, it is also open to anyone to say that he sees no adequate reason for this identification." Copleston, pp. 210-11.

- 15 Jacques Maritain, *An Introduction to Philosophy*, translated by B.I. Waikin (London and New York: Sheed and Ward, 1959), pp. 80-81. In an alternative definition of philosophy, Maritain refers to it as "the science of things in their first causes, in so far as these belong to the natural order." Ibid., p. 81.
16. Jacques Maritain, *Education at the Crossroads* (New Haven: Yale University Press, 1943), p. 72.
17. Ibid., p. 80
18. Involved in a further elaboration of this point is an explanation of the following: 1) the meaning and role of an "ultimate end of life" operative in all human decisions; 2) the functioning of a personal "world-perspective" in opening oneself to the world, including other persons; and 3) the necessity of recognizing one's "ultimate end of life" and "world perspective" from a philosophical and/or theological point of view.
- 19 While there is no strictly objective introduction to any academic discipline, the statement can be predicated of philosophy in a special manner
20. These few examples are in no way intended to represent even a thumbnail sketch of the history of Western philosophy. They are chosen because of their radical variations
21. For some comments on difficulties in "defining" existentialism, for example, see Copleston, pp. 125-47.
22. A potential test case for this assertion might be found in relating certain features of the thought of William James to that of Dewey and Josiah Royce. James is considered a pragmatist as is Dewey, while Royce is categorized as an idealist.
- 23 John Henry Cardinal Newman (1801-1890), a British theologian-philosopher, confirms this point of view. See *The Philosophical Notebook of John Henry Newman*, edited by Edward Sillem, Vol I *General Introduction to the Study of Newman's Philosophy* by Edward Sillem (Louvain, Belgium: Nauwelaerts Publishing House), Chapter III, pp. 67-148. (The personal character of philosophizing is related to a subsequent topic, the difficulty in considering the nature of research methodology in philosophy of education).
- 24 Maritain Notes that "Nobody can do without theology, at least a concealed and unconscious theology, and the best way of avoiding the inconveniences of an insinuated theology is to deal with theology that is consciously aware of itself." Maritain, *Education at the Crossroads*, p. 74.
25. For comments on the richness of philosophical differences and the significance of the history of philosophy, see Bochenksi, pp. ix and I. See also Frederick Copleston, S.J., *Philosophers and Philosophies* (London: Search Press; New York: Barnes and Noble Books (A division of Harper and Row, Publishers, Inc., 1976), pp. 17-28; Frederick C. Copleston, S.J., *Philosophies and Cultures* (Oxford: Oxford University Press, 1980), pp. 120-61; Frederick Copleston, S.J., *On the History of Philosophy and Other Essays* (London: Search Press; New York: Barnes and Noble Books (A division of Harper and Row, Publishers, Inc., 1979), pp. 3-65.
- 26 More specific meanings of these two technical terms, as they are employed here, follow.

"Closedness" is an attitude characterized by the possession of a (more or less conscious) particular, limited, present (theological-philosophical) stance from which a person functions intellectually and behaviorally in the world. "Openness" is an attitude characterized by the tendency to investigate the meanings of other persons' words and actions, and to consider the natures and functions of things and events in the world.

27. The dialectical relationship between openness and closedness bears directly upon the philosophical concepts of objectivity and subjectivity as pertinent to human knowing. Generally speaking, it appears that the greater the emphasis upon openness, the greater the tendency toward objectivity; whereas, an emphasis upon closedness seems to foster a similar stress upon subjectivity. In keeping with a desire for "balancing" openness and closedness, the objective and subjective poles require a similar kind of concern.
28. The "balance" referred to in this context is not unrelated to Buber's narrow ridge. In fact, one application of this doctrine by Buber is made to the correlative of past and present. See Maurice S. Friedman, *Martin Buber: The Life of Dialogue* (New York: Harper Torchbooks, Harper and Row, Publishers, 1960 (originally published by The University of Chicago Press, 1955), pp.3-10. Buber himself adverts to the narrow ridge in "What is Man?" *Between Man and Man*, translated by Ronald Gregor Smith (New York: The Macmillan Company, 1965), p.184.
29. Although precise requirements obviously can be disputed, it appears not unreasonable to suggest at least a "minor" in philosophy or its equivalent for the undergraduate years; approximately one-third to one-half of graduate programs should be devoted to studies in philosophy.
30. A very important pedagogical principle implicit in this state of affairs is the necessity of teaching the student in philosophy (of education) how to think, that is, how to derive conclusions from a starting point by means of a method of reflection.
31. See Aristotle, *Metaphysics*, Book IV, Chapter 4.
32. Temperament seems to be what William James had in view when he distinguished between the "tough-minded" and the "tender-minded." William James, *"Pragmatism" and Four Essays from "The Meaning of Truth"* (Cleveland and New York: Meridian Books, The World Publishing Company, 1964), pp. 20-23.
33. The philosophical problem involving the relationship between subjectivity and objectivity in human knowing represents a fundamental thematic issue in the history of philosophy.
34. This personal trait of philosophizing is related to philosophical research in the description of a graduate course called "Research" in the Department of Philosophy at the University of South Florida: "Individual research supervised by a faculty member. Approval slip from instructor required." *Accent on Learning*: General catalog of the University of South Florida, 1980-81.
35. In most instances, one could refer to first principles, a method (or methods) of thought, and conclusions of philosophy, with implications for education. That model, however, does not fit some analytic philosophies of education in the same manner that it does other modes of philosophy of education.
36. Employing Christianity as an example here may be more suitable than casual attention might detect in light of the overwhelming majority of United States citizens who claim to be Christians.

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## Managing Computerisation : A Study of an Educational Institution

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**T**HE success of an organisation's plan for introduction of new technology (computerisation) largely depends on its managerial strategy and the way it is managed. Automation of the tasks and processes has the immediate effect of simplifying the work system. However, in such a case system, components, including the human element, become more dependent on each other. Better work processes do take into account the views of all those who are connected with it.

The attitudes people towards the proposed technological change determine their response to the change; and failure to take these attitudes into account and to deal with them appropriately very often results in organisational collapses, communication breakdowns, strikes, etc. and non-cooperation in the implementation of changes (including computerisation) in the organisation. The reasons underlying resistance to change may be real or imagined. Therefore, management must balance their concern for technology and human sub-system change. Introduction of computerisation and industrial relations have close



interrelationship. It can range from excellent to catastrophic even in one enterprise.

Many of the organisations which introduce technology have an objective of increased labour productivity. However, greater productivity does not automatically result from an infusion of technology. It is necessary that it be managed efficiently. The technology need to be used to augment human capabilities. Technology and equipment are only tools, acceptance and utilisation are what make tools productive.

#### RESEARCH METHODOLOGY

The present study was designed to investigate the impact of change by the adoption of new technology (computerisation) in the working of an apex educational institution. Such an impact was studied in four areas, namely,

1. Nature of technological change on organisational structure;
2. Nature of technological change on the work process;
3. Impact of technological change on motivation and morale of users, measured through degree of satisfaction; and
4. Impact of technological change on productivity of users.

#### *Variables Chosen*

The operational definitions of the variables chosen are given below:

*User Category* was derived from the present category of posts held by the respondents, which consisted of the following three categories of employees:

1. *Administrative* (Registrar, Finance Officer, Administrative Officer, Publication Officer, Documentation Officer, Assistant Publication Officer, Hindi Editor, Section Officers, Assistants, Private Secretaries, Senior Personal Assistants, Senior Stenographers, Junior Stenographers, Upper Division Clerks, Lower Division Clerks, Typists).
2. *Technical* (Computer Programmer, Librarian Grade I, II, III, Technical Assistant (Computer), Computer Semi Professional Assistant).
3. *Research, Training and Consultancy* (Director, Consultant, Senior Fellows, Fellows, Associate Fellows, Project Fellows, Project Associate Fellows, Senior Technical Assistants, Project Assistants).

The categories of 'Research', 'Research and Training' and 'Research, Training and Consultancy' were merged after looking at the responses of the users and further discussions with the officers coming under these categories. These three categories combined, in other words, represented the 'faculty' of the organisation.

*Age of Users:* Age-groups of users of technology.

*Educational Background of Users:* Educational qualifications of users.

*Hours of Computer Use by Users in a Week:* To serve as an indication of enthusiasm of adoption of technological change rather than anything else.

*Organisational Structure:* Organisational Structure is a formal, established pattern of relationships amongst the various parts of an organisation or institution. It is reflected in the number of hierarchical levels, span of control, and the way in which parts are organised and related to one another. It was measured by studying the organisational structure prior to and after adoption of new technology.

*Users' Views on Work Process:* An organisation's work process enables one to study the questions like the amount of feedback and help the users of technology have from their "supervisor" and "co-workers", amount of challenge in users work, etc. as a better work process helps an organisation to achieve its objective of introduction of new technology like increased productivity, etc. It was measured in two ways. The first measure was obtained on the basis of Comprehensive Scores. The second was obtained on the basis of Highly Critical Questions. It enabled the researcher to measure the Users' Views on Work Process.

*Users' Views on Motivation and Morale* measured through degree of satisfaction: Motivation pertains to various drives, desires, needs, wishes, and other forces of a human being. 'Morale' describes the attitudes of the employees collectively towards all aspects of their work — job, organisation, working conditions, fellow workers, supervisors, and so on. A positive impact of technology on motivation and morale helps an organisation to achieve its objective of increased productivity, low costs, etc. In the present study the variable "Users' Views on Motivation and Morale" was measured on the basis of Comprehensive Scores and Highly Critical Questions Scores.

*Users' Views on Productivity:* Its meaning varies widely. However, improved productivity can be measured by the overall improved effectiveness of the total organisation. Increased productivity results in increased speed, reduce design costs and lead times. A human factor model of productivity in almost all cases results in a higher level of productivity than anticipated and sharp decrease in time spans. Users' Views on Productivity were also measured in two ways as for Users' Views on Work Process and Users' Views on Motivation and Morale mentioned above.

### *Methodology*

The study was conducted through a questionnaire, specially designed for the purpose. It consisted of two types of questions. One on the general impact analysis and the other on highly critical questions. Comments on the different aspects of the questionnaire were also encouraged. A five point scale used to responses of the users of computers. The highest score was given to that answer which was nearest to the particular section studying a particular aspect.

Unstructured interview method was also used for obtaining the views of the senior officers (who got their work done) on the responses elicited through the questionnaire. Before administering the questionnaire it was pre-tested and later suitably revised.

The impact analysis data of the study is based on 44 respondents who formed the total population of the computer users in the educational institution in question. These respondents were working with computers for administrative data processing; for research data processing; for word processing; and for other purposes.

Extensive review of the official documents of the organisation was also done. The information upon which the text is based comes primarily from the questionnaire, the researcher's observation, individual interviews, literature reviews and the researcher's own experience of working on computers as an employee of the institute. The data thus collected were analysed and the results and their interpretations were provided. These data were based on simple statistical techniques like mean, chi-square.

The results and interpretations are provided in three sections, namely, Reporting of Raw Data, Analysis and Interpretations of Basic Data and Results and Interpretations of Impact Analysis Data.

The first section (which is a brief one) simply reports the 'Raw Data' (raw scores of responses on the questionnaire). The second section on Analyses and Interpretations of Basic Data gives the said details on the delimited four variables. The third and the last section on Results and Interpretations of Impact Analysis Data provides qualitative as well as quantitative findings on various objectives of the study.

## RESULTS AND THEIR INTERPRETATIONS

### *Reporting Raw Data*

The raw data of 44 respondents on the variables of the study are given below. It is these data which were subjected to analyses of various kind.

The basic data consisting of the delimited four variables is given in this section in the form of statistical tables. Table 1 gives the data on "User Category". Table 2 gives the data on "Age of Users". Table 3 gives the data on "Educational Background of Users" and Table 4 on "Hours of Computer Use by Users in a Week".

Raw Data											
S No.	User Category	M/F	Age	Edul. Quali.	Hours Working on Computers in a Week	Type of Work on Computers	Work Process Score Comprehensive	Highly Critical Qs	Satisfaction Score Comprehensive	Highly Critical Qs	Productivity Comprehensive HE C
1.	A	M	B	B	E	ABC	44	23	46	9	57
2.	A	M	B	B	E	ABC	40	20	61	18	51
3.	A	M	B	B	E	AC	39	18	48	10	52
4.	A	M	B	B	B	C	39	20	59	18	49
5.	A	M	B	B	B	C	33	21	50	14	49
6.	A	F	B	B	C	ABC	42	18	53	13	46
7.	A	F	B	B	C	C	22	6	35	9	45
8.	A	F	B	B	D	C	40	19	46	11	52
9.	A	F	B	B	C	A	46	23	47	9	51
10.	A-P	F	C	B	A	C	48	25	47	12	54
11.	A-P	F	A	B	D	C	45	21	44	9	50
12.	A-P	F	B	A	C	C	41	17	47	12	52
13.	A-P	M	B	A	E	BC	40	15	52	13	50
14.	A-P	M	B	A	B	C	C	29	45	9	57
15.	A-P	M	B	A	E	C	40	20	48	9	53
16.	T	M	B	A	E	ABC	28	12	48	9	57
17.	T	M	C	A	C	D(LIB)	41	18	48	14	57
18.	T	M	B	B	E	D(ACA)	47	22	57	13	56
19.	T	M	A	B	E	D(LIB)	37	19	59	19	57
20.	T	M	A	B	E	D(LIB)	41	19	50	11	50
21.	A	M	B	B	E	C	41	18	52	12	56
22.	A	M	B	B	E	BC	42	19	47	8	53
23.	A-P	M	A	B	C	C	38	20	50	11	51
24.	R	M	C	D	C	BC	28	12	47	14	52
25.	R	M	C	D	A	BC	37	18	48	10	56
considered..											

1	2	3	4	5	6	7	8	9	10	11	12
26.	M <sup>o</sup>	M	C	D	C	BC	35	11	38	5	50
27.	R	M	C	D	D	BC	33	12	35	10	48
28.	R	M	C	C	A	B	40	21	50	14	54
29.	R	M	B	C	A	B	46	21	53	15	55
30.	R	M	B	D	C	BC	39	13	50	13	54
31.	R	M	B	D	C	BC	43	18	53	13	43
32.	R	M	B	D	B	B	49	23	57	16	57
33.	R	M	C	D	A	B	36	12	46	14	54
34.	R	M	B	C	A	BC	35	17	42	9	50
35.	F	F	B	C	A	B	32	17	44	11	57
36.	F	F	B	C	C	B	32	18	40	9	47
37.	R	F	C	C	E	BC	38	20	42	10	55
38.	R	F	B	C	B	B	26	12	45	11	33
39.	R	F	C	D	A	B	43	24	52	14	49
40.	R <sup>P</sup>	F	B	D	B	BC	45	23	48	9	56
41.	R	M	B	C	B	BC	33	12	51	10	58
42.	R	M	B	C	C	BC	36	15	45	9	52
43.	R	M	D	D	A	B	36	17	47	8	49
44.	R	M	B	C	B	BC	38	23	47	7	50

A = Adm. A = 25

R = Research B = 26-35

T = Tech C = 36-45

A = High school

B = B.A.

C = P.D.

D = Ph.D.

A = 1-5 hrs.

B = 6-10 hrs.

C = 11-15 hrs.

D = 16-20 hrs.

E = 21 and more

A = Adm. D.P.

B = Research O.P.

C = W.P.

D = Other

# INDIAN EDUCATIONAL REVIEW

TABLE 1 User Category					
Total Users	User Category	Total Employees*	Within Users	Category Non-users	
18 (40.91%)	Administrative	86	20.93%	79.07%	100%
5 (11.36%)	Technical (including Library)	8	62.50%	37.50%	100%
21 (47.73%)	Research, Training and Consultancy (faculty)	64	32.80%	67.20%	100%
44	Total	158			

\* includes project staff also.

TABLE 2 Age Distribution of Users		
Age-group	Frequency	Percentage of Population of Users
Less than 25 years	4	9.09
26 to 35 years	28	63.63
36 to 45 years	11	25.00
46 and above	1	2.28
Total	44	100%

TABLE 3 Educational Background of Users		
Educational Level	Frequency	Percentage of Population of Users
High School	7	15.91
Bachelor's degree	14	31.82
Master's degree	11	25.00
Doctoral degree	12	27.27
Total	44	100%

TABLE 4  
Hours of Computer Use by Users in a Week

No of Hours	Frequency	Percentage of Population of Users
0-5	9	20.46
6 - 10	7	15.91
11 - 15	12	27.17
16 - 20	4	9.09
21 and more	12	27.27
Total	44	100%

*User Category:* At the outset it may once again be emphasised that the interpretations which are given in this section are based on the views of the users and not on any actual record maintained by the organisation.

The results in Table 1 show that of the total users, 40.91% belong to the "Administrative" user category, 11.36% belong to the "Technical" user category and 47.73% belong to the "Research, Training and Consultancy" (faculty) user category. The results in users category show that it is as per the strategy of the organisation for introduction of computerisation. The objective of the organisation at the time of introduction of technological change was to provide this facility for the faculty. Out of the 40.91% administrative user category some of them were attached to the faculty as secretarial staff. This issue was further analysed by way of the following question in the questionnaire:

- |                                 |  |
|---------------------------------|--|
| Are you working with computer ? | Yes/No   |
| If so, how are you using it ?   | <ul style="list-style-type: none"> <li>- for administrative data processing</li> <li>- for research data processing</li> <li>- for word processing</li> <li>- others.</li> </ul> |

Replies to this question revealed that out of the total work done by the administrative category of staff, 9% was for administrative data processing and about 25% for word processing (both administrative and faculty and technical). This once again seems to be in consonance with the organisational strategy of introduction of this technological change. That is, there was more use of computers for Faculty and Technical staff and less for word processing.

When figures of total number of users in each User Category are compared with total number of employees within that category it is found that only 20% of the Administrative category are using the facility and 79.07% are the non-users.

Further, 32.80% of the Research, Training and Consultancy (faculty) are using the facility while 67.20% are non-users. These percentages also show that Research, Training and Consultancy (faculty) staff is using the computer facilities more than the administrative staff.

A question may be raised on the 79.07% non-users of technology in the administrative category of the educational institution. The Investigator's intimate knowledge of the organisation, personal discussions with senior officers as also observations revealed that this is because most of the senior and junior administrative, finance and publication officers are not using it. Likewise, most of the clerical staff like Lower Division Clerks, Upper Division Clerks are also not using it. The reasons for this, perhaps, are that they are not being encouraged to use this technology as the initial objective of introduction of technology was to facilitate research and quality material used for training programmes. Secondly, the nature of their work does not involve use of technology directly. Thirdly, lesser use may be because of less number of computers available or no 'personal' computers available in the educational institution.

Regarding the non-users in the Research, Training and Consultancy (faculty) category it is found that Director, Dean, Consultants and some of the Unit Heads are not using the facility directly because of their seniority in position; they also have not been given personal computers. However, they are sufficiently assisted by their junior staff. Likewise, some of the research staff is not making use of the facility. Therefore, it can be concluded that the technological change has been executed by the institution in terms of its set objectives.

62.50% of the Technical category (including library) are using the computer facility. It will be difficult to generalise on the percentage of users in the technical category because the population size is too small to draw generalisations. Even then a higher percentage is expected in this category because it consists of Computer Programmer, Computer Assistant, Computer and Library staff.

*Age Distribution of Users:* Table 2 reports that of the total users under study 9% users are less than 25 years of age, 64% users are in the age-group 26 to 35, 25% in the age-group 36 to 45, and 2% are in the age-group 46 and above. Proportionate figures for making a definite statement were not available. Percentage figures show that out of total users 73% are less than 35 years of age. It augurs well for the organisation, since younger manpower is less resistant to change. This is also an indication of a challenge for the management of the organisation, such a younger lot go on asking for the latest versions of technology. Moreover the organisation will need to cope with better and better training facilities to derive maximum benefit from the introduction of technological change. This will be so because younger persons find challenge in their work and are more career-oriented.

*Educational Background of Users:* Table 3 shows that out of the total users 16% of them have high school education, 32% bachelor's degree, 25% master's



degree and 27% doctoral degree. This was rather expected because of the organisation being a professional educational institution, where technological change was planned and introduced mainly for well qualified persons.

*Hours of Computer Use by Users in a Week:* Table 4 on Basic Data indicates that of the total users, 20.46% are using computer facilities for 0-5 hours in a week, 15.91% for 6-10 hours in a week, 27.27% for 11-15 hours in a week, 9.09% for 16-20 hours in a week and 27.27% for 21 and more hours in a week. As indicated earlier, the Computer Centre of the institution is equipped with three WIPRO PC-ATS, IBM PC AT compatible totally dedicated for data processing purposes. In addition, ten PC XTS are used primarily for training purposes. On an average computer users are making use of facilities for 11-15 hours in a week. Looking at the factor that the Computer Centre of the organisation closes from 8.00 p.m. to 9.00 a.m., the facilities available, their utilisation, and other factors (like computer down time, etc.) show that the facilities are being utilised by the computer users reasonably well and there is enough enthusiasm.

*Interpretations of Impact Analysis Data:* As per the design of the study, the data related to the impact of technological change in question fell in two major areas. The first area consisted of data analysis for general impact analysis; the other one formed part of in-depth analysis for investigating the impact of technological change in relation to the user category.

The data on general impact analysis are reported in four qualitative/quantitative tables that follow.

TABLE 5 Impact Analysis Data on "Comprehensive Scores" and "Scores on Highly Critical Questions": Users' Views on Work Process			
Score	Frequency: Comprehensive Scores	Score	Frequency: Scores on Highly Critical Qs. (14,17,19,20,21)
22-24	1	6-8	1
25-27	1	9-11	1
28-30	3	12-14	7
31-33	5	15-17	8
34-36	5	18-20	16
37-39	8	21-23	9
40-42	11	24-26	2
43-45	5	27-29	2
46-48	4		
49-51	1		
Total	44	Total	44
Mean = 38.25		Mean = 17.88	

The impact analysis data on comprehensive scores of "Users' views on Work process" show that its frequency distribution is a little skewed towards the right. However, no serious conclusions can be drawn from this trend because it was not subjected to any test of significance. The indications are that if such an exercise is taken in hand, the distribution is likely to turn out to be a normal distribution. Nevertheless, it is noticed that the frequencies above average are more than the frequencies below average. This could be taken as some sort of an indication that computer users are satisfied with the work process provided by the organisation.

The interpretations of the results given above for comprehensive scores also seem to be true for the frequency distribution of scores on highly critical questions.

From the results and their interpretations given above, one can thus conclude "process" show that its frequency distribution is a little skewed towards the right. systematically analysed but which became incidentally available to the investigator by question-wise analysis as well as personal discussions by the investigator with some of those concerned with the subject, because (i) there are less interruptions in the work of the users, (ii) the users seem to have more control of their work process, and (iii) there is a ready availability of help when they have a problem at hand related to the use of computers.

TABLE 6 Impact Analysis Data on "Comprehensive Scores" and "Scores on Highly Critical Questions": Users' Views on Motivation and Morale Measured through Degree of Satisfaction			
Score	Frequency: Comprehensive Scores	Score	Frequency: Scores on Highly Critical Qs. (27,28,35,36)
35-37	2	4-6	1
38-40	2	7-9	14
41-43	2	10-12	13
44-46	8	13-15	12
47-49	13	16-18	3
50-52	9	19-21	1
53-55	3		
56-58	2		
59-61	3		
Total 44		Total 44	
Mean = 48.15		Mean = 9.15	

The frequency distribution of comprehensive scores of "User's Views on Motivation and Morale" measured through degree of satisfaction show that it is nearly normally distributed. However, this trend was not subjected to any test of significance. The indications are that if such an exercise is taken in hand, the distribution will be found to be a normal one. Further, it is noticed that the frequencies below average are nearly the same as the frequencies above average. This is some sort of an indication that computer users' motivation and morale is more or less "average".

Frequency distribution of scores on highly critical questions shows that on the lowest as well as the highest scores the number of persons sharply decline whereas in the middle values the number of persons are equally distributed on the middle scores. The frequencies at the extreme values are too small to be taken into account. If these frequencies are left out, then the results show that the number of persons on the middle value of scores are equally distributed on the middle values. The investigator did not like to draw any definite conclusion from these findings as the frequencies were too small to generalise the issue.

One can conclude from the results and their interpretations given above that the motivation and morale of computer users is more or less "average".

TABLE 7 Impact Analysis Data on "Comprehensive Scores" and "Scores on Highly Critical Questions": Users' Views on Productivity			
Score	Frequency: Comprehensive Scores	Score	Frequency: Scores on Highly Critical Qs. (38 to 43)
33-35	1	18-20	1
36-38	-	21-23	-
39-41	-	24-26	9
42-44	1	27-29	22
45-47	3	30-32	11
48-50	11		
51-53	10		
54-56	10		
57-59	8		
Total 44		Total 44	
Mean = 51.90		Mean = 27.77	

The above table indicates that the frequency distribution on comprehensive scores is skewed towards the right. Serious conclusions can be drawn from this trend only when it is subjected to any test of significance. Yet it can be stated

that the frequencies above average are much more than the frequencies below average. This can be taken as an indication that computer users' views on productivity are that the technological change has resulted in its increase.

The interpretation of the results given above for comprehensive scores also seem to be true for the frequency distribution of scores on highly critical questions.

As is known, with technological change, given the same amount of input, a better output is possible (speed, accuracy, cost). The results show that the users do feel the same.

If a detailed analysis is made of the productivity of the institution before computerisation (this was not to be done within the scope of the present study), one will find that there has been an increase in the productivity of the institution in terms of number of researches completed and in hand, amount of research data analysed or being analysed, etc. On the administrative front also there are reports that systematic efforts have been made to bring possible areas of administration under computerisation, e.g. automatic granting of annual increments, excepting in cases involving clearance of Efficiency Bar. In accounts the institute computerised its pay-roll in 1982. On the library front data base of the library books being acquired under different subject heads is being built up. And, computerised monthly lists of additions to the library are brought out.

However, when one combines the results obtained from users' views on productivity (high) and the results obtained from users' views on motivation and morale (average), one feels like concluding that the technological change is being accepted by the users because of their personal enthusiasm rather than due to a well-directed and well-planned activity of the management, although the management is certainly making efforts to smoothen the work process.

#### *In-depth Analyses: User Category and Impact*

The 2x2 contingency table providing the data for studying the relationship between User Category, on the one hand, and Work Process, on the other, is given in Table 8.

The calculated value of Chi-square 6.73 is based on the equal probability of 11 in each cell within the contingency table. This calculated value has been found significant in comparison to the table value at 1 degree of freedom (3.84). This indicates that there is a relationship between user category and their views on work process. A look at the cell frequencies in the contingency table shows that as far as work process is concerned, more persons belonging to the administrative staff report above average views. In other words, they feel a higher impact of technological change in the organisation. These results are not very surprising because introduction of computers in the working of administration, many a time, results in better work process. Those who are in the faculty start making use of

computers much earlier. It percolates to the administrative culture later. That is why they are feeling greater degree of impact.

<b>TABLE 8</b> <b>Indepth Impact Analysis Data: Chi-square Test of Independence to Test the Relationship between User Category and Users' Views on Work Process as Measured through Comprehensive Scores</b>			
User Category	Users with Below Average Comprehensive Scores	Users with Above Average Comprehensive Scores	
Administrative	4 (11)	14 (11)	Chi-square Value = 6.73 Significant
Research, Training and Consultancy (faculty) (including Technical)	15 (11)	11 (11)	
Total	19	25 = 44	

The 2x2 contingency table providing the data for studying the relationship between User Category, on the one hand, and Motivation and Morale, measured through degree of satisfaction, on the other is given in Table 9.

<b>TABLE 9</b> <b>Indepth Impact Analysis Data: Chi-square Test of Independence to Test the Relationship between User Category and Users' Views on Motivation and Morale (Measured through Degree of Satisfaction) as Measured through Comprehensive Scores</b>			
User Category	Users with Below Average Comprehensive Scores	Users with Above Average Comprehensive Scores	
Administrative	10 (11)	8 (11)	Chi-square = 3.27 Not Significant
Research, Training and Consultancy (faculty) (including Technical)	16 (11)	10 (11)	
Total	26	18 = 44	

The calculated value of the chi-square 3.27 is based on the equal probability of 11 in each cell within the contingency table. The table value at 1 degree of freedom is 3.84. The calculated value of the chi-square is little less than the table value. Therefore, it was concluded that the difference was not significant. This means that there was no relationship between the user category and users' views on motivation and morale as measured through comprehensive scores.

The 2x2 contingency table providing the data for studying the relationship between User Category, on the one hand, and Productivity, on the other, is given in Table 10.

TABLE 10 Indepth Analysis Data: Chi-square Test of Independence to Test the Relationship between User Category and Users Views on Productivity as measured through Comprehensive Scores Users			
User Category	Users with Below Average Comprehensive Scores	Users with Above Average Comprehensive Scores	
Administrative	11 (11)	7 (11)	Chi-square =3.82 Not significant
Research, Training and Consultancy (faculty) (including Technical)	10 (11)	16 (11)	
Total	21	23 = 44	

The calculated value of chi-square for the above data is based on the equal probability of 11 in each cell within the contingency table. This calculated value has been found nearly significant in comparison to the table value at 1 degree of freedom (3.84). Therefore, it was safe to conclude that there was a relationship between the user category and users views on productivity. Cell frequencies showed that more persons in the faculty category had above average views on productivity. There can be two reasons for this. First, the faculty involved in giving views on productivity was also involved in recommending the change in technology. Secondly, actual productivity figures given in an earlier section also show that faculty is able to achieve more after the introduction of technological change.

The summary of results and interpretations given above were mostly based on the analysis and interpretation of the data provided in the preceding section. However, it will not be out of place to record some other results which were not

systematically analysed but which became incidentally available to the investigator in analysing various data. The analyses of the responses to the questionnaire established the following:

#### *Personal Data*

1. 36% computer users of the sample size in the institute are female.
2. Computer user respondents are using the computer facilities either for administrative data processing, research data processing (20.45%), word processing (25%), library, accounts data processing only or a combination of these e.g. 32% users are using computer facilities both for research data processing and word processing and 9% users are using it for administrative data processing, research data processing and word processing also.

#### *Work Process*

1. Very few staff members got training from other computer training institutes or suppliers of computers. Most of them had on-the-job instruction about computer working. A few of them had the institute's computer room formal training. About 90% of the computer users feel that they require more training.

#### *Organisation's Approach to Computerisation and Employees' Degree of Satisfaction*

1. There is a general feeling that there are bottlenecks, which affect the flow of computer work. About half the users find some frustration in getting their computer work done.
2. Most of the computer users feel that there is some strain due to computer work. The degree of strain, however, varies from very much to very little. Only 20% of the users felt that there is no strain whatsoever due to computer work. This may be because of the limited computer work they do as there are about 20% respondents whose 80% and more work time is involved in doing things that are not directly related to their computer job done.
3. About 90% of the computer users are satisfied with the conditions of work in the computer room.
4. 75% of the respondents are satisfied with the hardware and software available in the computer room of the institute.

#### *Productivity*

1. On responses to highly critical questions 70% respondents have indicated that computer work has resulted into overall increased productivity.
2. On the impact of computer on reduction of paper work, 45% respondents have

- rated, it very much; 45% somewhat and the remaining 10% a little.
3. The use of computer, has reduced rework in the following order: 70% very much; 20% somewhat and 5% 'a little'.
  4. 40% respondents feel that computers have reduced costs very much; 30% 'somewhat'; 20% 'a little' and 10% 'very little'.
  5. 35% respondents have indicated lack of management support as a limiting factor of productivity. An equal percentage has rated the factor of work being too tedious or repetitive as a limiting factor of productivity. The remaining 30% have indicated other reasons for the limiting factor of productivity.

#### SALIENT FINDINGS

The salient findings of the study are given below:

1. The objective of introduction of technology, namely, more use by 'faculty' and less for word processing work is being achieved.
2. Most of the computer users are young (less than 35 years) which augurs well for the organisation since younger manpower is less resistance to change.
3. Most of the computer users are highly educated, mainly because the organisation is a 'professional' educational institution where technological change was planned and introduced mainly for well-qualified persons.
4. Computer users are using the computer facilities reasonably well and there is enough enthusiasm.
5. Users indicate that in the organisation efforts are being made to keep the work process congenial for the introduction of technological change. There are less interruptions in the work of the users. The users seem to have more control of their work process and there is a ready availability of help when they have a problem relating to the use of computers.
6. Motivation and morale of the users is more or less 'average'.
7. Technological change has resulted in increased productivity of users.
8. Looking at the results obtained from the users views on productivity (high) and motivation and morale (average), it indicates that the technological change is being accepted by the users because of their personal enthusiasm rather than well-planned activity of the management.
9. There is relationship between the user category and their views on work process. More administrative persons have above-average views.
10. There is no relationship between the user category and users views on motivation and morale as measured through comprehensive score.
11. There is relationship between the user category and the users' views on productivity.



## LIMITATIONS OF THE STUDY

Before weighing the suggestions given above it is essential to know the limitations of the study. All research studies have limitations because they are a "delimited venture". Unless these limitations are specifically stated, wrong conclusions can be derived from the findings resulting in wrong generalisations.

Therefore, the limitations of the study need to be taken in the right perspective. Some of the important limitations of the study are as follows:

1. The study is based only on one educational institution. Therefore, generalisations derived in the study are based on a very limited sample.
2. The study was delimited to study the computer users of the Institute only. The views of the participating trainees were not obtained.
3. Even though all the computer users of the organisation have been covered in the study yet it is felt that the conclusions have been derived from limited data.
4. In-depth analyses have been done only on user category and not on other delimited variables.

## SUGGESTIONS

1. The rank and file employees be involved in the design and implementation of the new system as they are the best source of feedback about the various aspects of the workability or non-workability of the new system.
2. The employees be assured that their advancement prospects will be safeguarded and that everyone benefits (materially, socially, etc.) from the adoption of technology.
3. The adoption of technology should not be an overnight change; instead, it be a gradual one.
4. Support for computerisation must come from top management downwards.
5. Management must have a well directed and well planned activity to motivate the computer users and keep their morale high.
6. Management must balance their concern for technology and human subsystem change.
7. Organisation's work process must provide to its users an environment where there are less interruptions in their work, ready availability of help when they have a problem relating to the use of computers and where they have more control of their work process.
8. Training to computer users be provided after assessing their needs and be a continuous process so that computers are not used as word processors only.

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9. A comprehensive planning model for implementation of the system be developed by involving the system users. Though this will cause immediate delays but it will reduce the need for large scale changing.
10. The participation of employees should be encouraged and rewarded. It will improve the motivation and morale of the employees as it will promote a 'we' attitude rather than an 'us and them' feeling.
11. A high level of motivation and dedication needs to be maintained over a long period of time as the most difficult problems to deal with are long-term maintenance needs.
12. For jobs with limited flexibility, a clear career ladder with measurable performance criteria needs to be designed.
13. A formal organisational system be established to ensure managerial compliance with the required behaviours.
14. There is a need to replicate the research study by taking samples and detailed data from two or more organisations.
15. Comparative research studies should be undertaken taking data from educational and private sectors for studying the impact of technological change on the various aspects of the organisation.
16. In-depth analysis be done on the various other variables of the study like age, sex, educational qualifications, etc.
17. More robust techniques of statistical analysis like correlation, Chi-square need to be used for at least all the delimited variables chosen.

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## **Enactment of Roles by Home Science College Teachers in Teaching, Research and Extension**

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**T**HE roles of teaching, research and extension are most strategic in the system of higher education. Roles are referred to as expectations assigned to an individual, on the basis of the position he/she occupies and in terms of the actual behaviour performed.

The educational institutions comprise of a number of positions or statuses occupied by a number of actors. One of the important positions is of actors,

referred to as teachers. It is evident from the dawn of history, that knowledge is accumulated and is being passed through the pious duty of the teaching profession, where, the teachers are expected to act as a pivot in gathering knowledge, sifting it, and passing it on to the student community.

Today, the universities/colleges expect their teachers to perform three-fold roles, as of teaching, research and extension, which has been stressed by the educational policies and the University Grants Commission. The writings of several eminent authors also reflect the demand for research and extension roles to be played by college teachers, along with the teaching roles.

As any other field of higher education, Home Science education with its five specialisations — Foods and Nutrition (FN), Child Development (CD), Education and Extension (EE), Home Management (HM) and Clothing and Textiles (CT), calls for competent and effective teachers. The discipline assumes to have potential in improving the quality of :

- (a) Teaching — Transmission of subject matter from the teacher to the taught.
- (b) Research — Discovering new knowledge by formal, systematic and intensive process of analysis and pushing back the obsolete knowledge.
- (c) Extension — Reaching out to the community by assuming a wider role in the community upliftment programme, by extending the desired knowledge, abilities and skills; generating desired attitudes, beliefs and values; and creating scientific awareness in the community.

The UGC Policy framework (1981), declared that after teaching and research, extension or community service is the third most important responsibility of higher education.

The investigator thus felt the urge to analyse the roles of Home Science college teachers in teaching, research and extension, of which one aspect was role enactment.

From the teacher population the sample comprised of 139 teachers, from colleges of Home Science having two or more specialisations at M.Sc. level. The research tool comprised of a questionnaire in a check-list form, which was administered personally and by mail technique.

The check lists of roles were categorised as follows:

- (A) Teaching Role
  - Role of instructor
  - Role of communicator
  - Role of evaluator
- (B) Research Role
  - Role of researcher
  - Role of research guide

(C) Extension Role

- Role of extension worker
- Role of extension work guide.

ROLES

The roles were studied for role enactment on a five-point scale. The roles were also tested for relationship with the teacher variable such as area of specialisation, designation, occupation of father and occupation of spouse.

A. Teaching Role

This role will be discussed under sub roles as of instructor, communicator and evaluator.

*Role of Instructor* : The role activities under this role pertained to planning for imparting effectively knowledge, thoughts and skills to students, as well as guiding and directing the students.

The overall mean score revealed that teachers highly enacted the instructor's role. It is encouraging to note that most of the role activities were performed always such as of, teachers being available to students for guidance outside the classroom, being thorough with the subject matter knowledge and planning it in logical sequence, taking interest in solving academic problems of students, directing students to obtain appropriate references, planning method of teaching, and updating lectures with latest books and journals.

The role activity reported to be performed less frequently was of preparing handouts for complex topics. In Home Science area, there is dearth of books, specially written by Indian authors using Indian contexts. Therefore, handouts prepared by course teachers with relevant examples, will serve as supplementary learning material for students, leading to better comprehension of the subject matter. Thus, this role activity should be given more attention by Home Science college teachers.

*Role of Communicator*: The role activities pertained to transferring or transmitting information, thoughts, knowledge and skills to students as well as providing and receiving feedback from them.

As communicators, teachers reported to be highly enacting this role. The most frequently performed roles were of maintaining subject matter sequence while teaching, praising good answers by students, repeating subject matter not understood by students, using vocabulary within the range of students' comprehension, writing legibly on blackboard, providing examples from daily life experiences and inviting students' participation in class discussions.

Comparatively, less performed roles were of using variety of teaching methods and aids, relating teaching to students' background and inviting students

to present reports/papers. More emphasis needs to be given to planning and using variety of teaching aids and methods of teaching which are not found to be always practised by teachers while communicating.

It is generally observed, that teachers depend more on traditional methods like lectures, followed by discussion and laboratory method. The other teaching methods like field trip, committee work, role playing, directed and guided study, project method, special talks/reports were used less or rarely.

In teaching Home Science, there is scope of using variety of teaching methods and materials. There is a need of giving orientation or training to the newly recruited teachers of all five specialisations of Home Science, with regard to use of teaching methods and materials.

The teachers also need to relate their teaching to the background of students, so that they can find practical value of the subject learnt as Home Science Education, revolves on the all-round development of self, members of family and community.

The students also need to be more involved in terms of their participation in the communication process. This could be achieved by giving them opportunity to organise and express their learning by way of presenting reports or papers and by discussion, which will lead to more insightful learning.

*Role of Evaluator:* The activities under this role relate to assessing or judging the students' learning, in terms of achievements, progress, goal attained and lapses. Usual enactment was found in the evaluator's role. Very few role activities were performed always such as, planning of test papers keeping in mind the content coverage and stated objectives, evaluating the progress of students by tests and assignments periodically, and preparing subjective type, short-answer tests.

Most of the role activities need to be performed more frequently, such as, of preparing application type test papers, adding variety in preparing test papers such as, inclusion of objective tests like true and false items, matching items, filling up blanks, multiple choice items and subjective/essay type tests. For the same, principles of test construction should be kept in mind.

Assignments given to students should call for references from latest available books, journals and magazines. Assignments should be thought-provoking, self-study oriented and according to students' ability.

Preparation of model answers for tests and assignments were found to be least performed, which again demands attention of Home Science college teachers.

It is revealed that as compared to the role of instructor and communicator, the performance of role-activities under evaluator's role was less convincing. Evaluation is a very critical function to be performed by the teachers, as it is the only means through which the progress of the students can be determined. It is the basis for planning further teaching. It is essential to provide orientation and training regarding preparation of different types of test papers and other evaluative

## ENACTMENT OF ROLES BY HOME SCIENCE COLLEGE TEACHERS

measures, to newly recruited Home Science college teachers.

<p style="text-align: center;">TABLE 1 Mean Score Distribution Showing the Role Enactment of Home Science College Teachers in the Teaching Role</p>		
Teaching Roles	Mean Score	Categorisation*
- Instructor	67.83	High Enactment
- Communicator	78.93	High Enactment
- Evaluator	117.93	Usual Enactment

\* It is important to note that the categorisation of each sub-role varies as the 'N' that is No. of items or role activities in each sub Role is different.

### *Teaching Role Constraints*

The most reported constraint by Home Science college teachers was the failure to motivate students due to the lack of command over the medium of instruction (English) on the part of the students.

The general observation and discussion with Home Science college teachers, confirms that the student's lack of command over English, which is the medium of instruction in most of the Home Science colleges, is the major obstacle faced by the teachers while teaching. Students with vernacular medium of instruction, at school level, find it difficult to comprehend and express themselves in English. The teachers can encourage the students with language difficulty, to join English tuitions after the college timings. English can also be introduced as a compulsory course, in all the three years at undergraduate level, reason being that as a compulsory course it will invite more attention and effort by the students, than if taken voluntarily.

Moreover, at school level itself, English teaching should be checked and given more attention, as the school students are the potential college students. The sudden shift from vernacular language at school level to English at college level, may pose difficulty in comprehension of the subject matter and in written as well as orals expression of the same.

The other constraints reported by more number of teachers were experiencing difficulty in preparing teaching aids, using variety of teaching methods, evaluating the progress of students. As already discussed, such problems can be overcome by organising orientation training programmes and refresher courses for the teachers.

*Relationship Between Teacher Variables and Role Enactment in Teaching*

The role enactment was also tested for relationship with teachers' variables such as area of specialisation, designation, years of experience and occupation of father and spouse.

TABLE 2 Relationship Between Teachers' Variables and Role Dimensions in the Role of Teaching			
Relationship between role Dimension and Teachers' Variable	Df	X <sup>2</sup>	Significance
Role enactment — Area of specialisation	4	16	**
Role contentment — Area of specialisation	4	9.14	NS
Role enactment — Years of experience	4	2.81	NS
Role contentment — Years of experience	4	7.80	NS
Role enactment — Designation	1	1.42	NS
Role contentment — Designation	1	1.73	NS
Role enactment — Father's occupation	2	2.51	NS
Role contentment — Father's occupation	2	2.21	NS
Role enactment — Spouse's occupation	2	.309	NS
Role contentment — Spouse's occupation	2	2.03	NS

\* Significant at .05 level

\*\* Significant at .05 and .01 level

NS Not significant

In the teaching role enactment, significant relationship was found only with one variable, that is area of specialisation.

TABLE 3						
Percentages and Chi-square Value Indicating Relationship Between the Teachers' Area of Specialisation and Role Enactment in Teaching						
Sr.No.	Specialisation	Enactment				Total
		High		Average		
		+	%	+	%	
1	Foods and Nutrition	26	59%	18	41%	44
2	Home Management	20	91%	2	9%	22
3.	Education and Extension	22	92%	2	8%	24
4.	Child Development	16	57%	12	43%	28
5.	Clothing and Textile	18	86%	3	14%	21

Chi-square value 16, with df 4 is significant at .01 and .05 level.



A high majority of teachers of Education and Extension (EE) specialisation, followed by Home Management (HM) and Clothing and Textile (CT), reported high enactment of the teaching role. Above fifty per cent teachers of Food and Nutrition and Child Development specialisations, reported high enactment, and little less than fifty per cent reported average enactment.

The other variables were not found influencing the teachers' role enactment in teaching.

### *B. Research Role*

This role comprised of two sub-roles, as of researcher and research guide.

*Role of Researcher* : It relates to the teacher's involvement in an investigation or research study/project independently or in a team, which may or may not be funded by some agency or institution.

The teachers reported to be usually performing this role. The roles found to be most frequently performed were of reading research publications, exploring new areas of research, formulating research proposals, considering the research methodology, undertaking research projects and consulting colleagues/senior staff for suggestions. The less performed role was of publishing recommendations of the research study through research articles.

It is visible that due to the demands put on research by University Grants Commission (UGC) and local authorities, as well as by projecting it as a stepping stone for promotions and increments, more teachers are engaging themselves in research studies, which is an encouraging sign.

Bhoite (1980), around nine years back reported that the teachers signified a low key performance in the intellectually productive activities mainly research and publication. Thus, it can be stated that the teachers have progressed since then, in the performance of the research role.

The worth of research, however, is when its essence reaches others in the field, which can only be possible through publication of its findings and recommendations. Therefore, it becomes essential for the teachers to perform this role activity.

*Role of Research Guide*: This role pertained to the teachers guiding and directing the research study of post-graduate students (M.Sc./M.Phil./Ph.D.)

This role was responded by 65 per cent teachers most of the role activities were found to be usually enacted by the teachers such as encouraging students, readings on research articles and methodology, giving direction and evaluating research work at each stage, encouraging original ideas from students, helping students develop research proposals, exploring new areas of research, and creating students, awareness regarding sources of information.

The comparatively lesser performed roles were of encouraging students to

write research articles for publication and encouraging students to seek financial aid in the form of scholarships.

Writing of research articles for publication, can be made a part of their research work as without publication, the value of research is limited.

Seeking of financial aid in the form of scholarships, by the students should be encouraged by the teachers. These days several agencies/institutions provide junior/senior research fellowships, such as UGC, ICSSR, ICAR, ICMR, CSIR, and so on. Moreover, the universities also provide scholarships. The students need to be made aware of such scholarships and be encouraged to pursue for the same.

TABLE 4 Mean Score Distribution Showing the Role Enactment of Home Science College Teachers in the Research Role		
Research Role	Mean Score	Categorisation
Researcher	45.69	Usual enactment
Research guide	43.56	Usual enactment

### *Role Constraints in Research*

The highly reported constraint for research was less time for research work due to heavy work load. The other constraints were: difficulty faced in getting statistical help, interference by college administrators by not providing manual help like peon or attendant, and not providing typing and cyclostyling facilities and less time for research due to much clerical work in the department.

It is indicative that more of the constraints reported by the teachers were with reference to the college administrative structure and facilities.

### *Teacher Variables and Research Role Enactment*

The years of experience of the teachers, was the only variable which was found very significantly related, to role enactment of the teachers in research.

TABLE 5 Relationship Between the Role Dimensions and Teacher Variables in the Role of Research			
Relationship between Role Dimension and Teachers Variables	Df	$\chi^2$	Significance
Role enactment — Area of specialisation	8	7.15	NS
Role contentment — Area of specialisation	8	8.07	NS
			Contd.

# ENACTMENT OF ROLES BY HOME SCIENCE COLLEGE TEACHERS

Relationship between Role Dimension and Teachers Variables	Df	X <sup>2</sup>	Significance
Role enactment — Years of experience	8	29.97	**
Role contentment — Years of experience	8	19.83	*
Role enactment — Designation	2	4.76	NS
Role contentment — Designation	2	3.63	NS
Role enactment — Father's occupation	4	4.82	NS
Role contentment — Father's occupation	4	4.99	NS
Role enactment — Spouse's occupation	4	2.09	NS
Role contentment — Spouse's occupation	4	3.003	NS

\* — Significant at .05 level

\*\* — Significant at .01 and .05 level

NS — Not significant

It was revealed that around fifty per cent teachers having above 17 years of experience reported high enactment, whereas around fifty per cent teachers having experience of one to eight years reported low enactment. This indicates that the higher the experience, the more the performance of the research role.

TABLE 6								
Percentage and Chi-square Value Indicating the Relationship Between Years of Experience of Teachers in the Teaching Profession and Role Enactment in Research								
Sr. No	Years of Experience	Enactment						Total
		High		Average		Low		
		f	%	f	%	f	%	
1	1-4	11	36%	2	6%	18	58%	31
2	5-8	7	23%	8	27%	15	50%	30
3.	9-12	6	32%	9	47%	4	21%	19
4.	13-16	6	27%	14	64%	2	9%	22
5	Above 17	9	50%	7	39%	2	11%	18

Chi-square value 29.97 calculated with df 8 is significant at .01 and .05 level.

The findings can be justified, as the senior teachers who have already established themselves in the teaching profession get more opportunities to guide M.Sc. research, as well as engage in their own research work. They are likely to get more financial grants for research as they have a stronger bio-data to their

credit, whereas very junior teachers are still in the process of laying foundation for their career. They may have comparatively more teaching load as well as more clerical, departmental and supervision work. Thus, they may be left with less time for research, which also was the constraint which most of the teachers reported.

The other variables were not found to be significantly related to the enactment of research role.

### *C. Extension Role*

This role comprised of the sub-roles of extension worker and extension work guide.

*Role of Extension Worker:* The role pertained to the teachers' involvement in activities for the upliftment of weaker or deprived communities in both rural and urban areas.

The role was responded by 72 per cent teachers, who were found to be usually performing this role. The more frequently performed role activities were pertaining to the teachers being aware of rural/urban communities' condition, problems and welfare programmes through reading of newspapers/magazines, encouraging people to vote carefully in elections and to have small families.

The lesser performed activities were of encouraging people to form local organisations like co-operatives, balwadis, youth clubs, encouraging them to watch television and listen to radio programmes, to gain information on health and nutrition, agriculture, women's development activities, child welfare, sewing activities and so on.

Extension is given due attention in Home Science colleges. The teachers guide and supervise the extension work of students in urban and rural areas. The teachers also undertake extension-oriented research projects, through which, they come in constant contact with community people, mainly women and children. During their meetings with people the teachers can convey certain beneficial messages and encourage the people to perform those activities which were found to be given less attention by the teachers.

*Role of Extension Work Guide:* This role relates to the teachers guiding the students in carrying out extension work for the weaker sections of urban or rural communities.

The role was found to be performed usually by the teachers. The role activities performed more frequently by the teachers were helping the students explore agencies beneficial to the community, developing awareness among the students regarding community problems through magazines and local newspapers, research articles and surveys, determining the needs and interests of the community people and planning need-based programmes, considering resource persons and materials, considering place and time for conducting programmes, and helping

the students develop genuine interest for extension work.

Less frequently played roles were of encouraging rendering services at the time of mishaps, helping the students plan result-oriented programmes and encouraging programmes on civil consciousness. The latter roles need to be given due attention by Home Science college teachers.

TABLE 7 Mean Score Distribution Showing the Role Enactment of Home Science College Teachers in the Extension Role		
Extension Role	Mean Score	Categorisation
Extension worker	105.02	Usual enactment
Extension work guide	96.39	Usual enactment

\* It is important to note that the categorization of each sub-role varies as the 'N' that is the No. of items or role activities in each sub-role is different.

### *Extension Role Constraints*

The most represented constraint, was lack of time on the part of the community people to attend to the organised activities. Other constraints reported were pertaining to the community people not being receptive to organised programmes, having internal conflicts and lack of faith and motivation towards extension activities, and their non-cooperative behaviour. Other reported constraints were regarding the students who were found to be lacking interest and motivation for extension work, lacking persistence and command over local language as well as initiative for using variety of methods and audio-visual aids. As most of the community women and children are less educated and cannot depend much on verbal medium, the use of audio-visual aids, becomes indispensable in extension work. Therefore, use of audio-visual aids while teaching the community people should be made compulsory by the guiding teacher.

### *Teacher Variables and Extension Role Enactment*

Significant relation was found only with one variable— area of specialisation. High enactment of extension role was found by the teachers of Education and Extension specialisation, followed by the teachers of Child Development specialisation.

TABLE 8  
Relationship Between the Role Dimensions and Teacher Variables in the Role of Extension

Relationship Between Role Dimension and Teacher's Variable	Df	X <sup>2</sup>	Significance
Role enactment — Area of specialisation	6	13.99	*
Role contentment — Area of specialisation	6	10.57	NS
Role enactment — Years of experience	8	6.25	NS
Role contentment — Years of experience	8	11.45	NS
Role enactment — Designation	2	2.34	NS
Role contentment — Designation	2	1.07	NS
Role enactment — Father's occupation	4	1.29	NS
Role contentment — Father's occupation	4	2.55	NS
Role enactment — Spouse's occupation	4	4.10	NS
Role contentment — Spouse's occupation	4	6.99	NS

\* Significant at .05 level

\*\* Significant at .05 and .01 level

NS Not Significant

TABLE 9  
Percentages and Chi-square Value Indicating Relationship Between Area of Specialisation and Enactment of Teachers' Role in Extension

Sr. No.	Years of Experience	Enactment						Total
		High		Average		Low		
		f	%	f	%	f	%	
1.	Foods and Nutrition	9	36%	10	40%	6	24%	25
2	Home Management	9	47%	6	32%	4	21%	19
3.	Education Extension	19	86%	3	14%	2	0%	22
4.	Child Development	15	68%	5	23%	2	9%	22

X<sup>2</sup> = 13.99 with df 6 is significant at .05 level

Both the specialisations relate to social sciences and have comparatively more field, work, related courses, which could be the reason for higher enactment of extension roles by the teachers.

The response of the teachers of Home Management and Foods and Nutrition department was distributed in the categories of high, average and low enactment.

The teachers of Clothing and Textile specialisation did not respond to the Extension roles and they indicated it as not applicable to their specialisation.

#### CONCLUSIONS WITH REGARD TO VARIABLES

In all the three roles of teaching, research and extension, it was found that variables such as, professional status of teachers and occupation of father and spouse, were not found to influence the role performance of the teacher. This implies that whether the teachers are lecturers or readers, they are likely to perform the three roles equally. The occupation of father and spouse, whether academic, non academic in nature, does not make any difference in the role performance of the teachers.

It can be interpreted that independent variables of teachers, directly relating to the work environment of the teachers, such as area of specialisation and years of experience, exerted some influence on the dependent variable, that is, role enactment. However, with regard to teaching and extension roles, the years of teaching experience, whether more or less, was not found to affect the teaching or extension role performance of the teachers.

#### OVERALL CONCLUSIONS

1. The Home Science college teachers were found performing the teaching, research and extension roles. However, the extent of performance of role activities varied rolewise. Certain role activities were found to be very frequently performed which is an encouraging sign, but the less frequently performed role activities should be given special attention by the Home Science college teachers and administrators, as pointed out earlier.

2. The constraints reported by the teachers in teaching, research and extension should be given due emphasis by the administrators and teachers of Home Science colleges. This would enable the teachers to enact their roles more effectively.

#### RECOMMENDATIONS

I. (a) At the time of B.Sc. and M.Sc. admissions, there can be a written test aiming to assess the English language ability of the students at college level, most of the Home Science Colleges have English as the medium of instruction.

(b) At school level itself proper spoken and written English should be stressed by teachers and administrators.

II. (a) There is a need for teacher training courses for Home Science college teachers such as B.Ed. and refresher training programmes. Such responsibility can be taken up by the Home Science Education and Extension departments of

Home Science colleges as the specialisation deals with knowledge in curriculum planning, evaluation and measurement techniques, audio-visual aids/media and education technology, guidance and counselling. Knowledge of such subjects is indispensable for any college teacher.

(b) Most of the students passing out from colleges of Home Science become teachers, therefore, it is imperative that, irrespective of their specialisations, they must be taught courses which can enhance their perceptions of teaching. Such courses at B.Sc., M.Sc. and Ph.D. level can be offered by Education and Extension departments to students of other specialisations in Home Science.

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## Standardization of a Multiple-choice Vocabulary Test: Pretest and Analysis

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**A**LMOST all tests of English language being constructed in Indian universities, professional institutes and recruitment bodies are hypothetical tests. Standardized English language tests, therefore, need to be introduced at a large scale in our educational bodies too. Though the process of standardization is based on a specialized knowledge of the technology, yet it has to be accepted that there is no dearth of innovative brains in our educational institutes. Though the process is quite expensive yet the resources can always be generated by a team of experts indigenously without any aid from any alien agency. The process is time consuming and quite complicated yet the exactness of brains and the use of computers can sort out the problem. Through the present paper an attempt has been made to discuss elaborately and critically the process of standardizing a multiple-choice vocabulary test.

The assumptions on which the present paper is based are as follows:

1. Since vocabulary/lexicon is one of the common components applicable to all the four language skills, viz., listening, speaking, reading and

writing. It has been assumed proper to acquaint the teachers of English in India with a methodology for standardizing multiple-choice vocabulary tests mainly for large-scale testing. Large-scale testing is required at the time of admission to a particular course of study, at the time of achievement testing at school level and college level both, and for public examinations leading to placement in various organizations.

2. Since standardization of tests of English language is still at its infant stage, for practical purposes it is desirable to deal with one of the most significant aspects of standardization.

*Analysis of a pretest based on certain criteria.,*

(Analysis, being a very important aspect involved in standardization of a test, has been discussed on the basis of an empirical research conducted on a sample of Indian students in the succeeding sections).

For the purpose, a Model Vocabulary Test in Context (with key answers following it)\* was pretested on a heterogeneous population of 54\*, Indian students pursuing graduate courses in different disciplines

The Model Vocabulary Test in Context containing 30 items with key answers following it is produced below:

#### MODEL VOCABULARY TEST IN CONTEXT (PRETEST)

##### *Directions*

Each problem in this part of the test consists of a sentence in which one word or phrase has been italicised. From the four choices given you should choose one word or phrase which could be substituted for the italicised word or phrase without changing the meaning of the sentence.

Mark your choice on the answer sheet.

Put x against the appropriate choice on the answer sheet.

##### *Example:*

The *frown* on the man's face showed that he was displeased.

- (a) look of surprise
- (b) look of anger
- (c) look of delight
- (d) look of fear

The best answer is (b)

\* The test has been extracted from TOEFL, p. (137-140), Babin, Edith H. Cordes, Carole V; Nichols Harriet H. Department of English, Louisiana State University, Prentice Hall of India Private Ltd, New Delhi-110 001, 1994

+ Order No. 979; approval of a sample of 50 to 100 students

1. He tramped across the cream-coloured carpet, leaving a trail of mud behind him.
  - (a) walked heavily
  - (b) skipped
  - (c) walked unsteadily
  - (d) limped
2. The *tunnel* was so dark and clammy that we become frightened.
  - (a) long corridor
  - (b) underground passageway
  - (c) central aisle
  - (d) open ditch
3. My supply of confidence slowly *dwindles* as the deadline approaches.
  - (a) shifts
  - (b) grows
  - (c) emerges
  - (d) diminishes
4. Can this be a duplicate of the documents?
  - (a) a summary
  - (b) a revision
  - (c) an outline
  - (d) a copy
5. The gunfire was *sporadic*.
  - (a) intermittent
  - (b) frequent
  - (c) continuous
  - (d) distant
6. The chairman did not rule out the possibility of an agreement.
  - (a) promise
  - (b) reject
  - (c) accept
  - (d) forestall
7. *Punctuality* is imperative in your new job.
  - (a) being courteous
  - (b) being cheerful
  - (c) being on time
  - (d) being efficient
8. He *got nowhere* with his plan to balance the budget.
  - (a) succeeded completely

- (b) accomplished nothing
  - (c) fooled no one
  - (d) became obsessed
9. He ate a *prodigious* amount of the home-made bread.
- (a) slight
  - (b) tiny
  - (c) huge
  - (d) moderate
10. He is *infamous* for his dishonesty in business matters.
- (a) notorious
  - (b) dreaded
  - (c) loathed
  - (d) investigated
11. We were forced to postpone the picnic
- (a) Call off
  - (b) do without
  - (c) put off
  - (d) see about
12. The hunter carefully *stalked* the deer
- (a) shot
  - (b) tracked
  - (c) aimed at
  - (d) skimmed
13. There is a large area of *swamp* that will have to be cleared before construction can begin.
- (a) forest
  - (b) soft, wet land
  - (c) dry, sandy soil
  - (d) prairie
14. For once, everything in her life seemed to be in *equilibrium*.
- (a) disarray
  - (b) turmoil
  - (c) balance
  - (d) danger
15. The world leaders had a *chat* before beginning formal negotiations.
- (a) friendly, unimportant talk
  - (b) disagreement
  - (c) serious discussion

- (d) high level conference
6. Where did she *acquire* all her wealth ?
- (a) gain
  - (b) lose
  - (c) hide
  - (d) steal
17. He *resolved* to act more wisely in the future.
- (a) promised
  - (b) hoped
  - (c) consented
  - (d) decided
18. The jeweller reported that the diamonds were *genuine*.
- (a) perfect
  - (b) imitations
  - (c) real
  - (d) valuable
19. I decided to go to the party on the *spur of the moment*.
- (a) after careful thought
  - (b) for only a short time
  - (c) without previous thought
  - (d) at the earliest possible moment
20. The winners will be selected *at random*
- (a) by interviewing
  - (b) by competition
  - (c) by chance
  - (d) by testing
21. *Pilfering* by company employers costs many businesses thousands of dollars each year.
- (a) tardiness
  - (b) stealing
  - (c) absenteeism
  - (d) ignorance
22. The relativity theory is *basically* made up of two parts: the restricted and the general relativity theory.
- (a) fundamentally
  - (b) frequently
  - (c) usually
  - (d) approximately

23. The sales representatives were asked to go over the figures in their reports before the conference.
- (a) relate
  - (b) revise
  - (c) review
  - (d) calculate
24. Doctors prescribe *massive* doses of penicillin for patients with pneumonia.
- (a) daily
  - (b) heavy
  - (c) double
  - (d) adequate
25. Tornadoes are *violent* whirlwinds which vary in their width from a few yards to 1,300 feet.
- (a) fierce
  - (b) immense
  - (c) rapid
  - (d) chilly
26. The movie critic said that 'Airplane' the parody of disaster movies, was hilarious.
- (a) suspenseful
  - (b) very funny
  - (c) realistic
  - (d) very tragic
27. In spite of medical advances, cancer is usually *fatal*.
- (a) curable
  - (b) painful
  - (c) deadly
  - (d) disabling
28. The sculptor, Lorenzo Hiberti, *blended* medieval grace with Renaissance realism.
- (a) discovered
  - (b) combined
  - (c) produced
  - (d) invented
29. Identical twins are frequently inseparable; they even seem to think alike.
- (a) not able to be understood
  - (b) not able to be distinguished
  - (c) not able to be parted

- (d) not able to be believed
30. His extreme nervousness *impended* his ability to speak in front of large groups of people.
- hindered
  - halted
  - accelerated
  - fostered

*Key Answers to the Model Test in Context*

1. a	7. c	13. b	19. c	25. a
2. b	8. d	14. c	20. c	26. b
3. d	9. c	15. a	21. b	27. c
4. d	10. a	16. a	22. a	28. b
5. a	11. c	17. d	23. c	29. c
6. b	12. b	18. c	24. b	30. a

The students on whom the above test has been pretested have studied and passed English language and literature of 10+2 (Class XII). Out of 54 students, eight belong to the MBA course of the Institute of the Management and Technology, Ghaziabad (U.P.), 18 belong to the B.Com. (Hons.) Course of the University of Delhi, one belongs to the B.Sc. (Home Science) Course of the University of Delhi, and 27 belong to the B.A.(Pass) Course of the University of Delhi.

The pretest was administered in class room surroundings for the B.Com.(Hons.) and the B.A.(Pass) examinees, and in a reading room for the MBA and the B.Sc. (Home Science) examinees during the session 1989-90. It was invigilated by the author herself. Sufficient time limit was allowed to all the examinees to attempt each item in order to obtain sufficient data on the last items also in the pretest and to determine average time limit for a standard Multiple-Choice Vocabulary Test in Context.

**CRITERION**

After the pretest answer sheets were accumulated and scored, all the 30 vocabulary items were analysed to determine their effectiveness in terms of the following three criteria:

- Whether each of the 30 items can meet a suitable level of difficulty—neither too hard nor too easy for the population being tested (Determination of item Difficulty);
- Whether these 30 vocabulary items can discriminate between the

proficient subjects and the deficient ones (Determination of Item Discrimination);

3. Whether the distractors following each of the 30 items are effective distractors (Determination of the Effectiveness of Distractors).

### 1. Determination of Item Difficulty

For determining the difficulty level of each item, Harris's (1969)<sup>2</sup> technique has been employed in the paper. According to his technique, an analyst is supposed to ascertain the per cent of the sample who answered each item correctly. Multiple-choice vocabulary items (given in the pretest) which are excessively easy, i.e., those correctly answered by at least 92 per cent of the examinees, or unreasonably difficult i.e., those correctly answered by less than 30 per cent of the sample group, will be discarded as not contributing to the measurement function of the test. After analysing the difficulty level of each of the 30 items of the pre-test given in the preceding section, the following results as shown in Table 1 have been found.

TABLE 1 Determination of Item Difficulty			
Item No.	Percentage of Population Answering Correctly (Population of 54 Students)	Item No.	Percentage of Population Answering Correctly (Population of 54 Students)
1.	42.60	16	68.52
2.	74.88	17.	59.26
3.	48.15	18.	66.67
4.	85.19	19.	31.40
5	24.88	20.	51.86
6	46.30	21.	16.67
7.	77.77	22.	57.41
8.	50.00	23.	18.52
9.	53.70	24.	42.60
10.	46.30	25.	35.19
11.	50.00	26.	24.08
12.	37.04	27.	48.15
13.	37.04	28.	46.30
14.	83.34	29.	35.19
15.	40.75	30.	38.89

After an inspection of Table 1, it can be found that item Nos. 5 (24.88%),



21(16.67%), 23(18.52%) and 26 (24.08%) being unreasonably difficult and showing less than 30 per cent result have to be discarded at the time of assembling the final form of a standard test.

Twenty-six items which remain now must still meet the second of the three requirements, that is, discrimination.

## *2. Determination of Item Discrimination*

The second step is to determine how well each item discriminates between high and low level examinees, for each item in a test should help to distinguish the proficient subjects from the deficient subjects. An acceptable method is to assume that an examinee's performance on the total test will provide a reasonably good indication of his level of achievement or proficiency. Therefore, an analyst first separates the highest and lowest papers in terms of the total scores on the test. It is then to be determined how the two groups do on each item; the discriminating items will be those answered correctly by more of the high group than the low group.

Of the several statistical techniques that have been devised for calculating item discrimination, the following technique as already discussed in my last paper<sup>3</sup> has been employed and suggested in the paper.

Step 1 : Separating the highest and the lowest 25 per cent of the papers.

Step 2 : For each item, subtracting the number of "lows" who answer the item correctly from the number of "highs" who answer correctly, (If more 'lows' than 'highs' get an item right, the result of this calculation will of course be negative and should be marked with a minus sign).

Step 3 : Dividing the results of step 2 by the number of papers in each group, 'highs' and 'lows' to obtain the item 'discrimination index'.

As already mentioned we have a sample of 54 completed papers, the highest and the lowest 25 per cent have to be separated. Thus we have 14 'highs' and 14 'lows' out of a total population of 54 subjects.

Discriminatory power of each of the 26 vocabulary items (4 items having been discussed after the item difficulty analysis) has been determined on the basis of the above mentioned technique in Table 2 .

After examining the results of this step, it has been found that four more items: Item 1,2,4,12 are to be discarded as they have shown low discrimination:

Item 1(.21), 2(.21), 4(.21) and 12 (.07)

"Discrimination much below 30 should be either revised or discarded" (Harris, 1969)<sup>4</sup>. It can thus be observed that the analyst is left with 22 items, the distractors of which require a further analysis, and that is determination of effectiveness of distractors.

TABLE 2  
Determination of Item Discrimination

Item No.	Total No. 'Highs'	No. of 'Highs' Answering Correctly	Total No. of 'Lows'	No. of 'Lows' Answering Correctly	No. of 'Highs'/'Lows' Answering Correctly Subtract No. of 'Lows' Answering Correctly from No. of 'Highs' Answering Correctly	Item Discrimination Index (Result of Column 6 to be Divided by 14 (the size of Each Group of papers))	Satisfactory-S Dissatisfactory-S
1	2	3	4	5	6	7	8
1.	14	8	14	5	8 - 5 = 3	3 + 14 = +21	\$
2.	14	11	14	8	11 - 8 = +3	3 + 14 = +21	\$
3.	14	11	14	2	11 - 2 = +9	9 + 14 = +21	\$
4.	14	13	14	10	13 - 10 = +3	3 + 14 = +21	\$
5.	14	11	14	5	11 - 5 = +6	6 + 14 = +21	\$
6.	14	14	14	7	14 - 7 = +7	7 + 14 = +21	\$
7.	14	11	14	4	11 - 4 = +7	7 + 14 = +21	\$
8.	14	11	14	4	11 - 4 = +7	7 + 14 = +21	\$
9.	14	12	14	1	12 - 1 = +11	11 + 14 = +25	\$
10.	14	12	14	3	12 - 3 = +9	9 + 14 = +23	\$
11.	14	8	14	7	8 - 7 = +1	1 + 14 = +15	\$
12.	14	9	14	4	9 - 4 = +5	5 + 14 = +19	\$
13.	14	13	14	9	13 - 9 = +4	4 + 14 = +18	\$
14.	14	13	14	1	13 - 1 = +12	12 + 14 = +26	\$
15.	14	14	14	8	14 - 8 = +6	6 + 14 = +20	\$
16.	14	12	14	6	12 - 6 = +6	6 + 14 = +20	\$
17.	14	13	14	7	13 - 7 = +6	6 + 14 = +20	\$
18.	14	8	14	2	8 - 2 = +6	6 + 14 = +20	\$

contd.

# STANDARDIZATION OF A MULTIPLE-CHOICE VOCABULARY TEST

1	2	3	4	5	6	7	8
19.	14	14	14	3	14 - 3 = +11	11 + 14 = +79	S
22.	14	14	14	4	14 - 4 = +10	10 + 14 = 72	S
24.	14	11	14	3	11 - 3 = +8	8 + 14 = +57	S
25.	14	11	14	1	11 - 1 = +10	10 + 14 = +72	S
27.	14	12	14	3	12 - 3 = +9	9 + 14 = +64	S
28.	14	11	14	5	11 - 5 = +6	6 + 14 = +43	S
29.	14	8	14	3	8 - 3 = +5	5 + 14 = +36	S
30.	14	13	14	3	13 - 3 = +10	10 + 14 = +72	S

### 3. Determination of Effectiveness of Distractors

This step is also highly desirable in the analysis of distractors. It has been assumed that a distractors is ineffective if it attracts less than 30 per cent of the responses compared to the distractors attracting the maximum number of responses . For example, in Table 3 Item No.6, distractors 'a' and 'd' attracted only four and five responses, respectively, compared to distractor 'c' attracting 19 responses (maximum number of responses). The number of four and five responses of 'a' and 'd' is less than 30 per cent of 19 — the number of responses attracted by 'c'. Arithmetically, to find out an ineffective distractor a simple equation as given below can be followed:

$$\frac{100 \times \text{Distractor Response (DR)}}{\text{Maximum Distractor Response (MDR)}}$$

Taking the example of Item 6 where MDR is 19 and DR(d) 4, the percentage of DR (d) is as follows

$$\frac{100 \times 4}{19} = 21.05\%$$

(Therefore this shows that 21.05 per cent being less than 30 per cent of MDR (19), DR (d) is an ineffective distractor) Similarly, an effective distractor can be calculated.

On the basis of the above-mentioned assumption, given below is a table (Table 3) indicating elaborately the effectiveness of the distractors of each of those 22 items which were left for further analysis after the determination of item difficulty.

TABLE 3 Determination of E/I Distractors							
Item No.	No. of Responses for Each Choice (cc and D)					Percentage of Distraction (on the Basis of the Equation Given Above)	E/£ Distractor
	a	b	c	d	M		
3.	11	11	6	cc	o	$D(c) = \frac{100 \times 6}{11} = 54.55$	E
6.	5	cc	19	4	1	$D(a) = \frac{100 \times 5}{19} = 26.32$	£

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1	2					3	4
						$D(d) = \frac{100 \times 4}{19} = 21.05$	€
7.	2	3	cc	7	0	$D(a) = \frac{100 \times 2}{7} = 28.57$	€
						$D(b) = \frac{100 \times 3}{7} = 42.86$	E
8.	16	cc	5	5	1	$D(c) = \frac{100 \times 5}{7} = 31.25$	E
						$D(d) = \frac{100 \times 5}{7} = 31.25$	E
9.	9	5	cc	9	2	$D(b) = \frac{100 \times 5}{9} = 55.56$	E
10	cc	10	5	12	2	$D(b) = \frac{100 \times 10}{12} = 83.33$	E
						$D(c) = \frac{100 \times 5}{12} = 41.67$	E
11.	15	3	cc	9	0	$D(b) = \frac{100 \times 3}{15} = 20$	€
						$D(d) = \frac{100 \times 9}{15} = 60$	E
13.	16	cc	12	6	0	$D(c) = \frac{100 \times 12}{16} = 75$	E
						$D(d) = \frac{100 \times 6}{16} = 37.5$	E
14.	4	5	cc	0	0	$D(a) = \frac{100 \times 4}{5} = 80$	E
						$D(d) = \frac{100 \times 0}{5} = 0$	€
15.	cc	3	6	23	0	$D(b) = \frac{100 \times 3}{23} = 13.3$	€
						$D(c) = \frac{100 \times 6}{23} = 26.09$	€
16.	cc	11	5	1	0	$D(c) = \frac{100 \times 5}{11} = 45.45$	E
						$D(d) = \frac{100 \times 1}{11} = 9.09$	€
							contd.

1	2					3	4
17.	7	12	3	cc	0	$D(a) = \frac{100 \times 7}{12} = 58.33$ $D(c) = \frac{100 \times 3}{12} = 25$	E €
18.	5	0	cc	13	0	$D(a) = \frac{100 \times 5}{13} = 38.46$ $D(b) = \frac{100 \times 0}{13} = 0$	E €
19.	1	15	cc	21	0	$D(a) = \frac{100 \times 1}{21} = 4.76$ $D(b) = \frac{100 \times 15}{21} = 71.43$	€ B
20	4	17	cc	4	1	$D(a) = \frac{100 \times 4}{17} = 23.53$ $D(d) = \frac{100 \times 4}{17} = 23.53$	€ €
22.	cc	6	12	5	0	$D(b) = \frac{100 \times 6}{12} = 50$ $D(d) = \frac{100 \times 5}{12} = 41.67$	B E
24	11	cc	5	15	0	$D(a) = \frac{100 \times 11}{15} = 73.33$ $D(c) = \frac{100 \times 5}{15} = 33.33$	B B
25.	cc	17	13	5	0	$D(c) = \frac{100 \times 13}{17} = 76.47$ $D(d) = \frac{100 \times 5}{17} = 29.41$	E €
27.	8	11	cc	9	0	$D(a) = \frac{100 \times 8}{11} = 72.73$ $D(d) = \frac{100 \times 9}{11} = 81.82$	B B
28	14	cc	6	8	1	$D(c) = \frac{100 \times 6}{14} = 42.86$ $D(d) = \frac{100 \times 8}{14} = 57.14$	B B

contd.

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1	2					3	4
29.	6	17	cc	11	1	$D(a) = \frac{100 \times 6}{17} = 35.29$	E
						$D(d) = \frac{100 \times 11}{17} = 64.70$	E
30.	cc	8	13	9	3	$D(b) = \frac{100 \times 8}{13} = 61.54$	E
						$D(d) = \frac{100 \times 9}{13} = 69.23$	E

cc = Correct Choice

D = Distractor

E = Effectiveness

£ = Ineffective

M = Unmarked

After an inspection of Table 3, Item 6, distractors(a) (d); Item 7, distractor (a); Item 11, distractor (b), Item 14, distractor (d), Item 15, distractor (b), (c); Item 16, distractor (d); Item 17, distractor (c), Item 18, distractor (b); Item 19, distractor (a); Item 20, distractors (a), (d); and Item 25, distractor (d) are ineffective distractors. 'Non-functioning and mal-functioning distractors should be replaced, but the revised items should then be pre-tested again, for the original statistics will almost be affected by alterations' (Harris 1969)<sup>3</sup>.

Thus out of 22 items (left after the determination of item discrimination), 11 more items need either to be discarded or revised for pre-testing. After discarding 11 items more, we are left with items only which can be called standard items.

## DETERMINATION OF TIME LIMIT

For pre-testing, liberal time is allowed to each examinee. For standardization, Table 4 shows the time taken by 54 examinees and the average time to be allotted to them after calculating the average time required by the following four steps:

1. Separate the number of examinees taking the same time, e.g. three examinees taking five minutes, two taking 19 minutes, one taking 11 minutes, etc.
2. Multiply the number of examinees (N) with the time taken (T) by them  $N \times T$ , e.g. three examinees taking five minutes.

$$3 \times 5 = 15$$

2 Examinees taking 19 minutes

$$2 \times 19 = 38$$

3. Now add the total of  $N \times T$  shown in Table 4b (1154 minutes).
4. Divide the total of  $N \times T$  by the total sample of population  $P$  (that is the number of examinees  $N$ ) to obtain the weighted average time required for 30 items.

No. of Examinees (N)	Time Taken (T) (minutes)	$N \times T$
3	5	$3 \times 5 = 15$
2	6	$2 \times 6 = 12$
1	9	$1 \times 9 = 9$
1	10	$1 \times 10 = 10$
1	11	$1 \times 11 = 11$
1	12	$1 \times 12 = 12$
7	15	$7 \times 15 = 105$
1	16	$1 \times 16 = 16$
1	17	$1 \times 17 = 17$
2	19	$2 \times 19 = 38$
6	20	$6 \times 20 = 120$
4	23	$4 \times 23 = 92$
5	25	$5 \times 25 = 125$
1	26	$1 \times 26 = 26$
1	29	$1 \times 29 = 29$
10	30	$10 \times 30 = 300$
1	32	$1 \times 32 = 32$
3	34	$3 \times 34 = 102$
2	35	$2 \times 35 = 70$
1	33	$1 \times 33 = 33$

TABLE 4B

Total No. of examinees (N) : 54

$N \times T$  : 1154 minutes

$$\text{Weighted average } \frac{N \times T}{N} = \frac{1154}{54} = 21.37 \text{ minutes}$$

\* N is the number of examinees, that is the Population (P)



## STANDARDIZATION OF A MULTIPLE-CHOICE VOCABULARY TEST

Thus we find that 21.37 minutes is the average time required by the examinees for 30 items.

### DISCUSSION

1. After the pretest analysis, it can be seen that out of 30 vocabulary items only 11 items can be considered standard items and the rest are to be discarded.
2. For formulating standard tests and create a data bank of standard questions, a large number of examinees (say 200 to 300) need to be pretested.
3. For formulating a standardized test of say 100 items, a pretest should consist of about 250 to 270 items.
4. A test can be regarded standard when the distribution of the test scores as well as the time taken are distributed normally about the mean, that is, if we get a normal probability distribution between scores/times and the number of students at each score/time as shown in figure 1

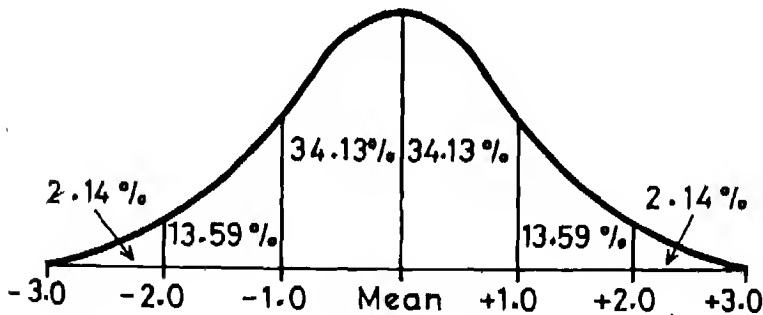


FIG. 1. Normal Probability Curve

But distribution can be obtained only when a test is administered on a very large sample of population. In the present survey, the number of students tested is very small (54) and hence normal trends are not visible.

The standard deviations of scores and times of the present test are found to be as follows:

Score SD = 5.56 marks

Time SD = 8.70 minutes

Statistically, if the test is standard, 68 per cent of the students should have

scored between one of the standard deviation limits, that is between (mean - SD) and (mean +SD); 95 per cent of the students should have scored between (mean - 2xSD) and (mean +2xSD); and 99 per cent of the students should have scored between (mean - 3xSD) and (mean +3xSD). After the present pretest analysis, 68 per cent students should be between 14-5.56 and 14+ 5.56 marks, that is between 8.44 and 19.55 and so on. But actually 78 per cent of the students scored between this range.

But as stated earlier, the results of the present pretest are not found in concordance with this rule for the very reason that the size of the population in our case is very small and the number of question items for the pretest are also very small. The teachers and the testers have to guard themselves against these factors while creating a data bank of standard tests.

5. While re-assembling a test for standardization, items should be re-ordered in order of their item difficulty. It can be seen with the help of Table 5 as to how 11 standard items can be re-arranged/re-assembled for reproducing a test.

<p style="text-align: center;">TABLE 5 Reproducing the Test in Order of Difficulty Level</p>			
Serial No. of Standard Items in the Pretest	Difficulty Level	Serial No. After Re- assembling	Serial No. at the Time of Reproduction
3	48.15%	1	4
8	50.00%	2	3
9	53.70%	3	2
10	46.30%	4	6
13	37.04%	5	10
22	57.41%	6	1
24	42.60%	7	8
27	48.15%	8	5
28	46.30%	9	7
29	35.19%	10	11
30	38.19%	11	9

6. Item analysis data should be recorded on an "item analysis slip" which contains
  - (a) the item, written out in full;
  - (b) an identification of the pretest in which the item was tried out;

# STANDARDIZATION OF A MULTIPLE-CHOICE VOCABULARY TEST

- (c) the position of the item in the pretest;
- (d) the item difficulty and discrimination indices;
- (e) a tabulation of how the "highs", "mids" and "lows" responded to the several choices.

A sample item analysis slip is shown in Table 6.

TABLE 6				
Sample Item Analysis Slip				
Pretest: Under-graduates — Vocabulary in Context				
Item No. 10				
He is <i>infamous</i> for his dishonesty in business matters.				
(a) notorious				
(b) dreaded				
(c) loathed				
(d) investigated				
Choices	Highs	Mids	Lows	
a	12	13	1	
b	0	5	4	
c	0	4	2	Difficulty: 46.30%
d	1	3	7	Discrimination: .64
M'	1	1	0	

## CONCLUSION

Thus we can conclude that multiple-choice vocabulary tests can be standardized on a large scale, keeping in view all the criteria mentioned in the paper. More research and practical work needs to be done in other skills also by the experts in the specialized field, so that, firstly, we start producing such indigenous tests of English language with the assistance and help of various educational and placement bodies and institutes can select suitable candidates for specific categories, and secondly, we start producing such students who can compete in the international market by obtaining the same high grades which they have already been obtaining in the area of physical sciences.

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## Ph.D. Theses Abstracts

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### *The Effect of Training on Controlled Experimentation During Adolescence*

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PIAGET's idea of education lays importance on experience involving direct action upon objects, a necessary precursor to concept formation and learning. Activity brings about the growth of cognitive structures. Such experience may accelerate or delay mental development but will not alter its essential character which proceeds in stages in every individual, i.e. mental mechanism becomes functional only with the maturation of the organism.

The major purpose of the study is to find out the role of training on controlled experimentation and its relationship to accelerated learning. More specifically speaking the objectives are to determine the status of thought at the three levels of intellectual development, viz. concrete, transitional and formal, using a suitable test among certain groups of adolescent pupils matched on intelligence, age, grade and socio-economic status; the effect of training on the three levels of intellectual development; the relationship between the various personality traits and the three levels of intellectual development; the personality character-

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istics of three pupils who are favourably influenced by training; the influence of training "sex-wise, age-wise and grade-wise; the effect of different modes of presentations of the problem; the difference in the mathematical structure of thought and personality traits in respect of experimental group through factor analysis; to point out main educational implications.

The total sample of three hundred and twenty students was split up into two main sub-groups, viz. the central and the experimental group. Each sub-group had about one hundred and sixty students. Each sub-group was again divided into two groups of boys and girls, drawn from grades seven to ten, twenty boys and twenty girls from each grade. The following tests were used —

- (i) Raven's progressive matrices to determine the intellectual level of the pupils.
- (ii) Socio-economic status questionnaire prepared by the investigator.
- (iii) H.S.P.Q. prepared by Cattell was used to measure personality traits.

The main investigation was split up into three stages.

*Stage I* — A battery of four stimulating problems. This was administered simultaneously on the control and experimental groups. These four problems consisted of Piaget type tests. The first three were based on the combinatorial scheme of thoughts, viz. the digital problem, beaker problem, magic seed problem. The last test was based on the exclusion of variable scheme of thought. The stimulating problems were followed by the fine tests of pre-test. These were wax problem, bending of rod problem, ramp problem, flow of liquid through a tube, and simple pendulum problem. These were based on two schemes of thought, controlling and separation of variables and exclusion of variables.

*Stage II* — The pre-test was followed by three training sessions imparted only to the experimental group at an interval of two weeks apart. The problems selected for the training sessions were the same Piagetian type test as of pre-test. The presentation varied from verbal, demonstration, pictorial to experimentation.

*Stage III* — Immediately after the third training session post-test was conducted on both the control and the experimental group. The post-test consisted of the same five Piagetian type tests as the pre-test.

## MAIN FINDINGS

The main findings emerging from the study are as below :

There is no significant difference between the pre-test scores of the control and experimental groups for different grades, age and sex. Significant difference was noticed between the pre-test and post-test scores of the control and experimental groups for the three levels of intellectual development, grade-wise, age-wise and sex-wise; in the various modes of presentation of the problem from

experimental to demonstration and pictorial, in the scores of the first and the last training session, sex-wise, grade-wise, age-wise for the three levels of intellectual development. Significant relationship was noticed between the personality factors and the post-test scores of those students who are favourably influenced by training. No significant relationship could be observed between the intelligence and the post-test scores of those students who show a favourable influence of training, grade-wise and age-wise. There is strong factorial structures underlying personality traits, intelligence and scheme of thought for those students who were favourably influenced by training. The four factors being separation of variable scheme of thought, adventurous, intelligence, self-sufficient, i.e. separation of variable scheme of thought, adventurous, intelligence, self-sufficient (preferring own decisions), resourceful.

#### IMPLICATIONS

The educational implications arising out of the study are.

Children should be allowed abundantly the processes rather than the products of thought. They need training in handling their erratic ideas. This is only possible through experimentation. The children should be encouraged to develop a scientific outlook, be able to discover scientific law. This can be possible by giving exercises in logical meaningful thinking of the learning tasks which initiate meaningful learning. The effectiveness of the training is mutually dependent upon the intellectual developmental level of the child, the type of problem and the kind of training technique used. This provides a basis for the construction of the curriculum, and successful teaching methods. Training with concrete material builds up a lively, interesting and activity-based atmosphere which promotes learning and helps teaching strategies. Through training procedures, creative capacities are encouraged. Training procedure gives each individual an opportunity to progress according to his mental capacity. By promoting activity in the classroom, the teacher can explore the child's potential for learning and permit him to evolve an understanding of the world around him. Through training the performance is so much faster on a mental level than on an overt level that the child is able to do more in a given period of time. The training procedures are in accordance with the laws of spontaneous learning, that is, from simple to complex and from concrete to abstract. This helps not only in meaningful learning but also in transfer of learning.



*Socio-economic Deprivation Among College Freshmen in  
Relation to their Certain Cognitive and Non-cognitive Factors*

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SOCIO-ECONOMIC deprivation is a lack of economic and social opportunity available to the majority of the population. Deprived people live under substandard economic conditions, they come from different cultural background and manifest different behavioural patterns (Goldberg, 1970). Advantaged-disadvantaged, privileged-unprivileged, and deprived-nondeprived are not absolute terms, rather they are relative terms. It is often observed that socio-economic deprivations produce unfavourable attitude towards self, parents and authority. Such persons suffer from physical and mental deficiencies and involve in antisocial acts. Socio-economic deprivation also affects adversely the development of cognitive and non-cognitive abilities.

There are many indices of socio-economic deprivation like caste, religion, culture, education, inhabitation, and so on. Investigators in the past have used only one or two indices of deprivation for measuring socio-economic deprivation. In the present study, three indices of deprivation, namely, caste, parental income and formal education of the respondent's father have been used.

OBJECTIVES OF THE STUDY

The present study was undertaken with three objectives in view: (i) to examine the association of socio-economic deprivation with certain background factors of the respondents; (ii) to compare the subjects of forward, backward and scheduled castes in respect of their cognitive and non-cognitive factors (verbal intelligence, self-concept of academic ability, academic motivation, anxiety, and adjustment with regard to home, health, social and emotional dimensions; and (iii) to compare socio-economically deprived and non-deprived subjects in terms of their cognitive and non-cognitive factors.



## HYPOTHESES

The following hypotheses were formulated for empirical verification:

1. Non-deprived group would score higher on verbal intelligence than deprived group.
2. Non-deprived group would have better self-concept of academic ability than deprived group.
3. Non-deprived group would score higher on academic motivation than deprived group.
4. Deprived group would score higher on anxiety than non-deprived group.
5. Non-deprived group would have better home adjustment than deprived group.
6. Non-deprived group would have better health adjustment than deprived group.
7. Non-deprived group would show better social adjustment than deprived group.
8. Non-deprived group would show better emotional adjustment than deprived group.

Beside these hypotheses, it was also proposed to examine the impact of certain background factors like marital status, inhabitation, sibling position, family composition and father's occupation on deprivation.

## SAMPLE

The sample comprised 400 male college freshmen, drawn from three groups, namely, forward caste (N=150), backward caste (N=236) and scheduled caste (N=114). The sample was drawn from four local colleges of Magadh University, Bodh Gaya, Bihar. The age range of the subjects varied from 14 to 20 years with a mean of 16.64 years.

## TESTS AND MATERIALS

The tests and materials used were:

1. Personal Data Schedule for eliciting information with regard to the personal characteristics and family background of the respondents.
2. Mohsin's (1968) General Intelligence Test
3. Singh's (1965) Academic Inventory
4. Taylor's (1953) Manifest Anxiety Scale
5. Mohsin-Shamshad (1970) Adaptation (Hindi) of Bell Adjustment Inventory.

## FINDINGS

The findings were as follow:

1. Verbal intelligence as measured through the Mohsin's General Intelligence Test differentiated significantly the deprived and non-deprived groups. As expected, the non-deprived group scored significantly higher on intelligence than the deprived group. Similarly, the forward caste group scored significantly higher on verbal intelligence than the scheduled castes.
2. Self-concept of academic ability and academic motivation as measured through the Academic Inventory did not differentiate significantly the deprived and non-deprived groups. However, the forward caste group scored significantly higher on self-concept of academic ability than the scheduled castes. The backward caste scored significantly higher on academic motivation than the forward and scheduled castes.
3. Manifest anxiety as measured through the Taylor's (1953) Manifest Anxiety Scale failed to differentiate the deprived and non-deprived groups. However, as expected, the forward castes scored significantly less on anxiety than the scheduled castes.
4. Out of four dimensions of adjustment, namely, home, health, social and emotional as measured through the Mohsin-Shamshad Adaptation of Bell Adjustment Inventory, only health adjustment differentiated significantly the deprived and non-deprived groups. As expected, the non-deprived group (forward castes) was found to have better health adjustment than the deprived group (scheduled castes).
5. The dichotomised variable of socio-economic deprivation tended to bear significant and positive association with intelligence, anxiety, health adjustment and emotional adjustment. In case of other variables (self-concept of academic ability, academic motivation, home adjustment and social adjustment), insignificant positive correlations were found.
6. The deprived and non-deprived groups of subjects differed significantly in terms of their frequencies on marital status, inhabitation, sibling position and father's occupation as assessed through the Personal Data Schedule. The percentage of married subjects, rural inhabitants, first and second born subjects, having their fathers in agriculture was more in the deprived group than in the non-deprived group.

## CONCLUSIONS

The following general conclusions can be drawn from the present study:

1. Non-deprived college freshmen are more intelligent as compared with their deprived counterparts.
2. Non-deprived students suffer less from health adjustment problems than the deprived group.
3. Subjects belonging to the forward caste have better self-concept of academic ability than those belonging to the scheduled castes.
4. Subjects of the forward castes have less anxiety than those of the scheduled castes.
5. Rural-based first and second born married subjects, having their fathers in agriculture, suffer more from deprivation as compared with urban-based later born, unmarried subjects, having their fathers in service and business.

To conclude, non-deprived college freshmen possess more intelligence, better self-concept of academic ability, low anxiety and less adjustment problems in health dimension than the deprived group. The present study has, however, limited focus. A similar study needs to be carried out in rural, semi-urban and urban settings covering relevant variables. Some attempts should be made to highlight the role of personality, motivation, values, etc. in deprivation. In spite of certain limitations of the present study, it may prove a guideline for future research to be conducted in this area from the socio-psychological angle.

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## *Development and Validation of Criterion-Referenced Test (CRT) on Vowel-coalition in Sanskrit Language*

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**I**N the last two decades, there has been a stress on individualized instruction and evaluation within individual progress. This purpose is achieved by CRT. The changes involved are reflected in what the individual has learned. Hence, the development and validation of an ideal CRT is the crying need today in the field of education.

### OBJECTIVES OF THE PRESENT STUDY

1. To develop criterion-referenced test on Vowel-coalition (Svarsandhi) in Sanskrit language for the students of Standard VIII studying in Gujarati-medium secondary schools of Gujarat state.
2. To validate the proposed test.

### SAMPLE

The study was carried in the urban and rural areas of Jamnagar District (Gujarat state), the urban area, viz. Bhanvad and the rural area, viz. Verad and Gunda. Fifty girl students and fifty boy students were selected from each of the areas.

### PROCEDURE

1. The preliminary considerations consisted of four aspects, viz. test purpose, specification of content area, identification of groups to be measured and identification of qualified staff. All these four aspects were duly treated.
2. The selected content was specified minutely. The well-defined behavioural domains were prepared on the basis of the content.

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Bhavnagar University (1989).

3. Sixteen-item forms were prepared after adopting Hively's Item form-Item writing technique.
4. The logical review was conducted to assess the congruence between item and objective. The evaluation of the representativeness of item measuring each objective was done by employing five-point scale.
5. The deficient items were duly revised and rewritten.
6. Empirical review was conducted to examine the instructional sensitivity of items. An initial form of the test was administered to 200 examinees — girls as well as boys — selected from urban as well as rural areas.
7. After the empirical review, it was found that no item required revision.
8. The items were randomly selected from the universe of items. Two parallel forms of the test were prepared. The "fill in the blank" type item format was adopted for all the items.
9. Three kinds of validity — content, construct and criterion-related — were established. For this purpose, both the parallel forms of the test were administered to 200 examinees — girls as well as boys — selected from both the areas. The present group was different from that group which was employed for the empirical review.
10. Two types of reliability — the domain score estimation and mastery classification decision — were established.
11. The cut-off score was determined for all the behavioural domains of both the parallel forms.
12. The administrator's and technical manual was prepared.

#### FINDINGS

1. The minute specification of the domain of vowel coalition enabled the investigator to prepare sixteen well-defined behavioural domains.
2. Adopting Hively's item form, the maximum possible number of items were generated on vowel coalition, i.e. in proportion to availability of textual non-textual words.
3. For the initial form of the test, a pool of 776 items was generated on the basis of sixteen well-defined behavioural domains by following closely the rules regarding item writing technique.
4. The perfect congruence was found between item and objective. After reviewing all the items logically, it was found that the item objective congruence index (IOCI) of each item was +1.
5. Each item was representative of its objective and the degree of representativeness was high.
6. The pre- to-post test difference index (PPDI) of all the items ranged from 0.15

- to 0.69. The instructional sensitivity of each item was quite satisfactory.
7. The items were selected randomly from the pool of the logically and empirically reviewed items. The principle of generalizability was observe after selecting the items randomly.
  8. Two parallel forms were prepared. Each of the two forms consisted of 212 items.
  9. There was perfect content validity in the present test as IOCI of each item was +1.
  10. The graph-based unidimensional indices of each behavioural domain of both the parallel forms ranged from 0.07 to 0.70, i.e. all of them were positive and the item of each domain measured their respective construct or domain
  11. The critical ratio of differences of the mean scores of instructed-uninstructed groups of all the behavioural domains of both the parallel forms was significant at 0.01 level.
  12. The sum of the examinees' estimated domain score in each behavioural domain of both the parallel forms ranged from 0.00 to 0.20.
  13. The indices of mastery-non-mastery classification decision reliability ranged from 0.79 to 0.90 in both the parallel forms of the test. The present test proved reliable for mastery-non-mastery classification.
  14. The cut-off score determined for each of the behavioural domains of both the parallel forms lay between 1 to 10. The test became capable for mastery-non-mastery classification due to the determination of the cut-off score.

#### RECOMMENDATIONS FOR THE USE OF THE PRESENT CRT

1. The present test can be used for the measurement of achievement after teaching vowel coalition in order to implement the concept of constant evaluation as mentioned in New National Education Policy.
2. The present test can be used when the necessity arises to evaluate the implementation of the educational programmes like programme learning and module-based on vowel-coalition.
3. The present test can be specially useful when the classification of examinees is to be made into mastery-non-mastery categories for mastery at learning of vowel coalition.
4. The present test can be used to diagnose the learning deficiencies of the examinees in vowel coalition.

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## *Factorial Nature of Numerical Aptitude and its Bearing on Mathematical Learning*

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**A**s a matter of fact, teaching and learning of a subject are interdependent and interrelated. That is the involvement of teaching with abilities identified as significant predictors of success in that subject facilitates its learning. Since mathematics is a basic subject in the school curriculum, its teaching and learning have always been central concerns in educational research. The desire to improve the effectiveness of mathematics teaching has been, to a great extent, fulfilled by researches that have attempted the identification and measurement of mathematical abilities, as these abilities provide stimulating questions and intriguing informations to the broader study of human learning, in general, and mathematics learning, in particular. Further, a number of studies done by Rogers (1918), Cameron (1925), Fouracre (1926), Oldham (1935) and Hamza (1951-52) have revealed that success in mathematics equally depends on success in different branches of mathematics. Thus, it is clear that different kinds of mathematical abilities are needed for the successful mastery of mathematics curriculum. It is also a well-established fact that every student can not achieve a similar level of mastery in mathematics or in other school subjects, as individual differences in learning capacity always exist. There are students who can do well in mathematics but not in other subjects. These individual differences exist because of many psycho-social and educational variables within and outside the individual child. However, researches in the area of ability testing and prediction of educational achievement indicate that, besides other factors, specific abilities required for that particular subject are important to the prediction of success in that subject. Studies (Hamza, 1951; Wringley, 1958; Chauhan, 1981) in the area of achievement in mathematics have established that numerical ability is basic to success in mathematics. However, what factors of numerical ability affect or contribute to the learning of which areas of mathematics, i.e. arithmetic, algebra or geometry, etc. is still not established by research.

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Banaras Hindu University (1987).



The present investigation was undertaken with a specific aim of answering this question. That is, to establish the differential contribution of the factors of numerical ability on learning in arithmetic, algebra and geometry among tenth grade students.

#### OBJECTIVES OF THE STUDY

Specifically, this study was designed to achieve the following objectives:

1. To find out the number of basic factors underlying numerical aptitude
2. To study the nature of basic factors underlying numerical aptitude.
3. To study the contribution of the numerical aptitude test to the learning of arithmetic, algebra and geometry.
4. To study the contribution of basic factors underlying numerical aptitude to the learning of arithmetic, algebra and geometry.
5. To study the contribution of the numerical aptitude test to the learning of mathematics taken as the combination of arithmetic, algebra and geometry.
6. To study the contribution of basic factors underlying numerical aptitude to the learning of mathematics taken as the combination of arithmetic, algebra and geometry.

#### HYPOTHESIS

This study was based on exploratory factor analysis in which nothing could be guessed as to what would be the number and nature of the basic factors underlying numerical aptitude and how much variances they account for in the learning of arithmetic, algebra and geometry and mathematics as a whole. Therefore, no hypothesis was formulated.

#### METHODOLOGY

##### *Design of the Study*

This study belonged to the category of descriptive field research and was conducted in three phases. In the first phase, all the tests were prepared, the second phase included data collection, scoring test booklets and preparing master charts for computerisation, and the third phase carried out the analysis and interpretation of the data.

##### *Sample*

This investigation was carried out in high schools and intermediate colleges

of Varanasi city. The aggregate of all male students studying in Class X in the 1984-85 academic session constituted the population. Three hundred male students of Class X from eight intermediate colleges selected through random cluster technique constituted the sample.

## TOOLS

The following tools developed by the researcher himself were used to measure the variables of the study.

1. Numerical Aptitude Test (NAT): This test was developed in a battery form in which 12 different types of tests of numerical aptitude were included. A brief summary of this test battery is given below.

Numerical Aptitude Test	Symbolic Representation of the Test	No. of Items Included	Nature of Test	Reliability Coefficient
1	2	3	4	5
Number Group Property	NAT <sub>1</sub>	10	Homogeneous	KR-20 0.72
Group Member Identification	NAT <sub>2</sub>	10	do.	KR-20 0.64
Number Group Addity	NAT <sub>3</sub>	10	do.	KR-20 0.70
Number Relations Operational	NAT <sub>4</sub>	10	do.	KR-20 0.68
Number Relations, Digital	NAT <sub>5</sub>	10	do.	KR-20 0.73
Number Correlates Operational	NAT <sub>6</sub>	10	do.	KR-20 0.63
Number Correlates Digital	NAT <sub>7</sub>	10	do.	KR-20 0.74
Number Operations	NAT <sub>8</sub>	10	do.	KR-20 0.68
Number Series	NAT <sub>9</sub>	10	do.	KR-20 0.75
Arithmetic Operational Sequence	NAT <sub>10</sub>	10	do.	KR-20 0.67
Problem Solving	NAT <sub>11</sub>	10	do.	KR-20 0.75
Number Matrix	NAT <sub>12</sub>	10	do.	KR-20 0.68
Numerical Aptitude Test NAT		120		KR-20 0.97

2. Achievement Test in Mathematics (ATM): This test was developed by the researcher himself in three parts. In the first part, there was an achievement test in arithmetic, the second part consisted of an achievement test in algebra and an achievement test in geometry was included in the third part. A brief summary

of the test is as follows.

Achievement Test	Concept Included	No. of items	Reliability Coefficient
<i>Part I</i> Achievement Test in Arithmetic (ATA)	(i) Decimal (ii) Fraction (iii) Percentage (iv) LCM and HCF (v) Ratio and Proportion	20	KR-20 0.76
<i>Part II</i> Achievement Test in Algebra, (ATA)	(i) Factorisation (ii) Number systems (iii) Indices (iv) Roots (v) Equations	20	KR-20 0.71
<i>Part III</i> Achievement Test in Geometry (ATA)	(i) Area (ii) Volume (iii) Line and Angle (iv) Triangle (v) Circle	20	KR-20 0.70
Achievement Test in Mathematics (ATM)		60	KR-20 0.76

### Data Collection

The researcher visited the selected Intermediate colleges of Varanasi city and administered all the tests on 300 Class X boys included in the sample. The test booklets were then scored as per the scoring procedure laid down for them. The score of an individual on a particular test was the number of items he did right.

### Analysis

The data processing was carried out on a computer and the analyses were done in the following phases:

Phase I: Statistical averages such as mean, median, standard deviation, skewness and kurtosis were computed to see the score distribution pattern of the tests.

Phase II: All the numerical aptitude tests were factor analysed by principal factor method, followed by vari-max rotation.

Phase III: A stepwise regression analysis was carried out to observe the contribution of the numerical aptitude tests and the extracted factors from them to achievement in arithmetic, algebra and geometry and achievement in mathematics taken as the combination of arithmetic, algebra and geometry.

## MAJOR FINDINGS

The investigation yielded the following findings:

1. The factor analysis of 12 sub-tests of Numerical Aptitude Test-Battery resulted in the emergence of three common factors, namely, "Numerical Reasoning", "Numerical Facility" and "Visualization of Numerical Patterns." All the three factors account for 57.88 per cent of variance in the total set of 12 variables with 27.95 per cent contributed by the factor "Numerical Reasoning", 16.94 per cent by the factor "Numerical Facility" and 12.99 per cent by the factor "Visualization of Numerical Patterns". The remaining 42.12 per cent is due to specific and error factors.
2. The first factor "Numerical Reasoning" was best represented by four sub-tests of Numerical Aptitude, namely, Arithmetic Operational Sequence, Number-Relations (operational), Number correlates (Digital) and Group-member-Identification, all based on, more or less, the ability to find relationships and correspondance in the Numerical situation. The percentages of variance explained by Factor I in the tests which represent it, are 59.08 per cent, 51.94 per cent, 44.50 per cent, and 40.24 per cent.
3. The second factor named "Numerical facility" was characterised largely by the sub-test Number operations which is purely a test of computational ability using four fundamental operations of arithmetic. The sub-test Number-Group Property also gave significant loading in this factor. The percentages of variance explained by the factor in the sub-tests which represent it are 59.54 per cent and 42.95 per cent.
4. The third factor, namely, "Visualization of Numerical Patterns" was characterised by sub-tests problem-solving and Number-Matrices which are based on recognizing implicit numerical systems or patterns. The percentages of variance explained by the factor in the sub-tests which represent it are 62.08 per cent and 58.56 per cent.
5. The multiple regression analysis of achievement test in arithmetic on the sub-tests of Numerical Aptitude Test-Battery revealed that three sub-tests, namely, Group Member-Identification, Number-Matrices and Number-Group Property were found to be the best predictors of achievement in arithmetic. However, the total variance explained by these sub-tests was only 9.34 per cent which means that there are factors other than numerical aptitude which explain 90.66 per cent of variance.
6. The multiple regression analysis of achievement test in algebra on the sub-tests of Numerical Aptitude Test battery revealed that three sub-tests,

- namely, Arithmetic Operational Sequence, Number Correlates (Operational) and Number Operations were the best predictors of achievement in algebra. However, the total variance explained by these three sub-tests was only 19.19 per cent which means that there are factors other than numerical aptitude which explain 82.81 per cent of variance.
7. On the basis of multiple regression analysis of Achievement Test in geometry on the sub-tests of Numerical Aptitude Test battery, it was found that only two sub-tests, namely, Arithmetic-Operational Sequence and Number-Correlates (Digital) were the best predictors of achievement in geometry. However, the total variance accounted for by the combination of these two tests was found to be 7.50 per cent of total variance. This indicates that there are other factors which explain 92.50 per cent of variance.
  8. When the multiple regression analysis of the total score in the combined Achievement Test in Mathematics on sub-tests of Numerical Aptitude Test battery was conducted, it was found that three sub-tests, namely, Number-Correlates (Operational), Arithmetic Operational Sequence and Number Group Property were the best predictors of achievement in mathematics. The total accountable variance explained by these three sub-tests was 16.60 per cent which shows that there are factors other than numerical aptitude which explain 83.40 per cent of variance.
  9. The multiple regression analysis of arithmetic achievement on the factor scores was also carried out. The results indicated that arithmetic achievement was predicted by two common factors, namely, "Numerical Facility" and "Visualization of Numerical Patterns". The total variance in the scores of arithmetic achievement which was explained by the combination of these two factors was 8.10 per cent. The remaining 91.90 per cent variance could not be explained by the common factors of numerical aptitude. This shows that there are factors other than numerical aptitude which account for the major portion of variance in arithmetic achievement test scores.
  10. The results obtained by the process of multiple regression analysis of algebraic achievement on the factor-scores indicated that algebraic achievement was predicted by the two common factors, namely, "Numerical reasoning" and "Numerical Facility". The total variance in the scores of algebraic achievement which was explained by the combination of these two factors was 14.49 per cent. The remaining 85.51 per cent variance could not be explained by the common factors of numerical aptitude. This means that there are factors other than numerical

apitude which account for the major portion of variance in algebraic achievement test scores.

11. The multiple regression analysis of achievement scores in geometry of the factor-scores of Numerical Aptitude was also carried out and the results obtained by this process have shown that only one factor, namely, "Numerical Reasoning" predicted achievement in geometry. The total accountable variance in the scores of geometrical achievement which was explained by the factor was 4.93 per cent. The remaining 95.07 per cent of variance could not be explained by this factor. This means that there are factors other than numerical aptitude which account for the major portion of variance in achievement in geometry.
12. The multiple regression analysis of the combined Achievement Test in mathematics on the factor-scores of Numerical Aptitude was also carried out, and on the basis of the results so obtained it was found that only two factors, namely, "Numerical Reasoning" and "Numerical Facility", were found to be the best predictors of achievement in mathematics. The total variance in the scores of achievement in mathematics which was explained by the combination of these two factors was 14.51 per cent. The remaining 85.49 per cent variance remained unexplained by the common factors of Numerical Aptitude. This means that there exists other factors different from numerical aptitude which account for the unexplained portion of variance in mathematics achievement test scores.

#### GENERAL DISCUSSION

When the results obtained from the factor analysis and multiple regression analysis were considered together, a clearer picture of the phenomenon under investigation was obtained. As mentioned earlier, the factor-Numerical Reasoning was best represented by the NAT-variables 10,4,7 and 2. Similarly, the second factor Numerical Facility was represented by the sub-tests 8 and 1, and the factor Visualization of Numerical Patterns was best characterised by sub-tests 11 and 12. The remaining sub-tests 3,5,6 and 9 have given significant loadings on two common factors. Hence, they do not represent a single factor present in them.

When the results of the two multiple regression analyses, one with NAT-sub-tests as independent variables and another with NAT-factors as independent variables, were compared, more meaningful inferences could be drawn. The regression analysis has shown that scores on arithmetic test are best predicted by sub-tests 2 and 12, and also by the factors Numerical Facility and Visualization of Numerical Patterns, which are together represented by the sub-tests 8,1,11 and 12. This shows that variable 12 is a common predictor in both the cases and the

remaining three variables 2,1 and 11 have appeared only in one of the two regression analyses.

Similarly, in the case of algebra, the NAT-variables 10,6 and 8 made significant contribution to the prediction. On the other hand, two factors Numerical Reasoning and Numerical Facility characterised by the NAT-variables 10,4,7,2,8 and 1 also were found to be the best predictors. This shows that the only two NAT-variables 10 and 8 are common to both the analyses. A similar comparative judgement shows that only variable 10 is common to both the analyses related to geometry. In the same way, when the combined mathematics test was considered, it was found that variables 10,6 and 1 were found to be common predictors in both the analyses.

In general, it can be stated that variable 12 (Number-Matrices) can be considered as a significant predictor of achievement in arithmetic; variables 10 and 8 are dominant predictors of achievement in algebra; variable 10 is a single best predictor of achievement in geometry; and variable 10, 6 and 1 are the best predictors of achievement in mathematics. It is also clear from the table that all the three branches of mathematics are significantly correlated.



### *Relationship Between Locus of Control, Anxiety, Level of Aspiration and Academic Achievement of Secondary Students*

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**I**NSPITE of intellectual capacities, scholastic aptitude and uniform classroom instruction, large number of students are encountered with failure and under-achievement. It is asserted that apart from minimum academic requirements, the quality of scholastic performance depends upon certain personality, motivational, cognitive, attitudinal, environmental and other factors.

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Allahabad University (1987)

In this study, an attempt has been made to investigate some of the non-intellectual correlates, particularly personality (locus of control and anxiety), motivational (level of aspiration) and background (socio-economic status) factors of academic achievement.

Out of the bulk of researches, the researcher chose to study the relationship of the above-mentioned variables with academic achievement. It is hoped that knowledge of such relationship and the relative contribution of each to the prediction of academic achievement would open new vistas for considering strategies for remedial and reconstructive teaching. For obvious reasons, the research findings reported in the Western countries regarding these variables cannot be accepted in our country without empirical confirmations.

#### OBJECTIVES

This study was conducted to attain the following objectives:

1. To assess the magnitude and direction of relationship of locus of control, anxiety, level of aspiration and socio-economic status with academic achievement for different groups formed on the basis of:
  - (a) curriculum,
  - (b) sex,
  - (c) socio-economic status, and
  - (d) internality and externality.
2. To determine the contribution of locus of control, anxiety, level of aspiration and socio-economic status to the variance in the prediction of academic achievement separately and jointly.
3. To find out whether significant mean differences exist, between the different groups formed on the basis of.
  - (a) curriculum,
  - (b) sex,
  - (c) socio-economic status, and
  - (d) internality and externality, on locus of control, anxiety, level of aspiration, socio-economic status and academic achievement.

#### HYPOTHESES

To attain the above-mentioned objectives, the following hypotheses were put forth for testing:

1. Locus of control would show significantly negative relationships with academic achievement for the following groups:
  - (a) total sample,



- (b) groups formed according to:
    - (i) curriculum,
    - (ii) sex; and
  - (c) curriculum and sex-wise break-up of the sample on socio-economic status.
2. Anxiety would be significantly and negatively related with academic achievement. The relationship will hold good for:
    - (a) total sample,
    - (b) total sample stratified on:
      - (i) curriculum,
      - (ii) sex, and
    - (c) curriculum and sex-wise break-up of the sample on:
      - (i) socio-economic status, and
      - (ii) internality and externality.
  3. Level of aspiration would yield significantly positive relationships with academic achievement for the following:
    - (a) total sample;
    - (b) total sample further divided on the basis of:
      - (i) curriculum,
      - (ii) sex; and
    - (c) curriculum and sex-wise break-up of the sample on:
      - (i) socio-economic status, and
      - (ii) internality and externality.
  4. Socio-economic status and academic achievement would show significantly positive relationships for the following groups:
    - (a) total sample;
    - (b) total sample stratified on the basis of:
      - (i) curriculum,
      - (ii) sex; and
    - (c) curriculum and sex-wise break-up of the sample on internality and externality.
  5. Locus of control, anxiety, level of aspiration and socio-economic status, in a multi-variate analysis, will have differential prediction values for academic achievement singly and conjointly for the following groups:
    - (a) total sample;
    - (b) total sample categorised on the basis of:
      - (i) curriculum, and
      - (ii) sex.
  6. Significant mean differences would be found on locus of control, when

the groups compared are formed on the basis of:

- (a) curriculum,
- (b) sex, and
- (c) sub-groups divided on socio-economic status.

7. Significant mean differences would be observed on anxiety, level of aspiration and academic achievement, between the following groups of students, classified on the basis of:

- (a) curriculum,
- (b) sex, and
- (c) curriculum and sex-wise break-up of the sample according to:
  - (i) socio-economic status, and
  - (ii) internality and externality.

8. Significant mean differences would exist on socio-economic status, when the groups compared are formed on the basis of:

- (a) curriculum,
- (b) sex, and
- (c) sub-groups divided on internality and externality.

#### DESIGN AND PROCEDURE

This study belongs to the category of descriptive field survey with the composite characteristics of inter-group comparison, correlational and prediction studies.

#### *Sample*

The final sample comprised of 670 students of average intelligence drawn from a population of 3,780 students of Class XI of Hindi-medium schools of Allahabad city, using the random, proportionate and cluster sampling techniques. Curriculum and sex-wise distribution of the sample showed that there were 180 boys from the arts and 240 boys from the science curricula, and 180 girls from the arts and 70 girls from the science curricula.

#### *Instrumentation*

In order to attain the objectives of this study. The following measuring instruments were used for collecting the data:

- 1. Test of General Mental Ability (M.C. Joshi)
- 2. Rotter's I-E scale- adapted in Hindi by the investigator.
- 3. W A. Self-Analysis Form (D. Sinha)
- 4. L A Coding Test (A. Ansari and G.A. Ansari)
- 5. Socio-economic status Index (R.P. Varma and P.C. Saxena)

6. Aggregate marks of High School Examination conducted by the U P Board.

### *Statistical Techniques*

Descriptive statistics (measures of central tendency and variability) revealed that the data did not deviate much from the normal distribution. Zero-order correlations, step-wise Multiple Regression Analysis and t-test were applied to analyse the obtained data.

### CONCLUSIONS

General conclusions of the study are:

1. Locus of control has been found to correlate negatively and significantly with academic achievement for the total sample; arts and science curriculum students; boys and girls, boys and girls of the arts and science curricula; boys of the arts curriculum belonging to high, middle and low socio-economic status, boys of the science curriculum belonging to high and low socio-economic status, girls of arts curriculum belonging to high socio-economic status only; and girls of science curriculum belonging to middle and low socio-economic status.
2. Anxiety has been found to have a significantly negative correlation with academic achievement for the total sample; arts and science groups, boys and girls, boys of arts and girls of science curriculum; science girls of the middle socio-economic status; internal boys of arts curriculum; and external girls of arts curriculum.
3. Level of aspiration correlated negatively and significantly with academic achievement for the total sample; arts students; boys belonging to arts curriculum; high socio-economic status; arts boys and science girls; and externality-oriented girls of science curriculum.
4. Socio-economic status has been found to have a significantly positive correlation with academic achievement for the total sample; arts and science students; boys and girls; boys and girls of arts and science curricula both; internally and externally controlled boys of arts and science curricula; internally and externally controlled girls of arts curriculum; and internally controlled girls of science curriculum.
5. All the four variables, viz. locus of control, anxiety, level of aspiration and socio-economic status predicted academic achievement, but socio-economic status and locus of control were found to be the best predictors.
  - (a) Locus of control was found to be the best predictor of academic achievement for boys; boys (arts) and girls (science). For rest of the groups — total sample; girls; boys (science) and girls (arts) it was the

second best predictor. The percentage of variance in academic achievement thus accounted for by locus of control ranged between 1.41 to 18.13 for the different groups.

- (b) Socio-economic status was found to be the best predictor of academic achievement for the total sample; girls; science boys; and arts girls. It accounted for the total variance in predicting academic achievement from 9.25 to 14.27 per cent for the above groups. It was the second best predictor of academic achievement for boys; science girls; and arts boys. It explained 5.44 and 7.09 per cent of the total variance in the prediction of academic achievement.
- (c) The percentage of total variance in the prediction of academic achievement, explained by anxiety, ranged from .13 to 2.09 per cent. For boys from the arts and science streams, arts boys and science girls anxiety was found to be the best predictor; and it was the best predictor for the total sample and for girls. It did not contribute meaningfully to the prediction of academic achievement for boys of science and girls of arts curricula.
- (d) Level of aspiration was responsible for predicting .07 to 1.57 per cent of the total variance in academic achievement. In step-wise multiple regression analysis it came third in succession for the total sample; girls; and girls of arts curriculum. It was the best predictor for the boys groups (arts and science combined) and for arts stream boys. It did not play any role in the prediction of academic achievement for science curriculum boys and girls.

6 t-comparisons showed that academic achievement and anxiety differentiated the maximum number of groups.

- (a) Arts students (boys and girls combined) were found to be more external in their locus of control, possessed high anxiety and were characterised by low achievement as compared to science students.
- (b) Boys (arts and science combined) were found to be high achievers, more internally controlled and less anxious than girls.
- (c) High socio-economic status students, irrespective of curriculum belonging and sex, were found to be high achievers, more internally controlled and less anxious in comparison to their counterparts belonging to the middle and low socio-economic status.
- (d) Externally controlled boys and girls of either curriculum, had higher anxiety scores and low academic achievement scores than their internal counterparts.

The results obtained have tended to substantiate all the hypotheses — some fully and others partially, except hypothesis (iii) which is rejected for almost all the groups.

#### EDUCATIONAL IMPLICATIONS

This study has re-affirmed the importance of locus of control, anxiety, level of aspiration and socio-economic status in academic achievement. The need for such a study was felt because of high incidence of academic failures and under-achievement, surfacing education at all ladders, specially at 10 and +2 stages. The findings of this study have not only lent some additional support to the foregone studies conducted in this area, but have also revealed some new findings.

The findings of this study have shown that external locus of control, high level of anxiety, unrealistic level of aspiration and low socio-economic status hamper academic achievement. Thus it is the duty of teachers, parents and others concerned with education to see that they provide such an environment and experiences to their wards which develop in them an internal locus of control and moderate anxiety, and help them to set up realistic goals commensurate with their potential. This is perhaps possible through careful nurturance of experiences that encourage self-reliance and independence. This should be taken care of from early childhood. Over-protection and belief in factors like luck, chance, fate, etc. as causal factors in outcome should not be encouraged to be internalised by students.

When parents impose their wishes on their children and have high expectations from them, they develop high anxiety which interferes with their cognitive processes. This results in lowering of achievement among children because high anxiety creates a need to avoid learning situations. Thus warmth and support with very little personal criticism are needed if high anxiety learners are to do well.

On locus of control and anxiety, boys and girls have been found to differ significantly. This finding suggests that girls, more often than boys, see what happens to them as determined by forces other than themselves. They play a passive dependent role; whereas boys are expected to forge their own destiny. Therefore, care should be taken in providing such an environment in which students in general, and girls particularly, develop a sense of self-reliance and decision-making capacity in crucial matters of choosing a career and way of life.

In the Indian set-up, boys and girls are discriminated. There are different norms for work, behaviour and conduct of life for both. Girls as compared to boys get lesser exposure and fewer opportunities to prove their self-worth; temperamentally they are sensitive and apprehensive of facing the outer environment with the result that, when they are confronted with realities of life to which they

were not oriented to, they develop anxiety. An atmosphere of freedom at home and school, fostering of scientific attitude, doing away with unnecessary discriminations, and exposure to the realities of life would leave them less disillusioned when they find contradiction in ways of life they were given to live and that they find later.

Arts and Science students have been found significantly different from each other with respect to their academic achievement. This may be due to the difference in importance given to the subjects of both the curricula, the study habits of children and the attitudes of the society. To bridge this gap, changes have to be brought about in the teaching methods, the attitudes of the pupils and the society, as also the evaluation system.

Another important finding of this study is the significant contribution of locus of control, anxiety, level of aspiration and socio-economic status in predicting academic achievement.

It follows logically that these variables can be of help to teachers, parents, guidance workers and counsellors in understanding the phenomenon of academic failure and under-achievement among students. Through counselling interviews and careful bringing up, positive personality and motivational factors may be fostered among children which in turn would modify their academic behaviour.



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## Research Notes

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### *Relationship Between Temperament and Academic Achievement*

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PEOPLE differ in many different ways, but so far as modern scientific psychology is concerned, it is precisely in two fields of intelligence and temperament that most fruitful investigations into individual differences have been conducted.

According to Collins (1953), the term 'temperament' covers all the characteristic, affective and conative tendencies shown by an individual. Guilford (1964) defined temperament as a significant aspect of personality that includes all emotional traits of an individual. Crow and Crow (1958) were of the opinion that temperament refers more particularly to a form of emotional response that is inborn. Allport (1961) postulated that temperament is the characteristic phenomenon of an individual's nature including his susceptibility of emotional situations, his customary strength mood, and all the peculiarities of fluctuation and intensity of mood, these being phenomena regarded as dependent on constitutional make up, and therefore, largely hereditary in origin. Thomas, Chess and Birch (1970) found that temperamental factors exist from an early age and remain reasonably constant over the years.

Review of related research reveals that traits of temperament have been studied by various researchers in relation to age (Bending, 1960); socio-economic

status (Sharma, 1975; Mandawat and Thakar 1987); interest (Nachman, 1960), occupational choice (Triggs, 1947); extroversion/neuroticism (Bending, 1962); work style (Strelav, 1970); giftedness (Bonasall and Steffbre, 1955; Windholz, 1968); Creativity (Paramesh, 1976-77; Sharma and Kumari, 1983); academic achievement (Oates, 1929, Lynn, 1957; Kagan, 1965; Messer, 1970; Paisey and Paisey, 1982) and Sex (Maccoby and Jacklin, 1974; Thomas and Chess, 1977).

Studies on the relationship of temperamental traits and academic performance are very few. So far as Indian research scenario is concerned, the investigator could not find any study. This scarcity of research prompted the investigator to undertake the present study. Due to lack of ample research evidence it was postulated that there will be no relationship between temperamental traits and academic achievement of students at the +2 stage.

## METHOD

The present exploratory study was conducted through descriptive survey method of research within ex-post-facto research design.

## Sample

Fifty male and fifty female subject studying in Class XII and belonging to the arts stream in three senior secondary schools of Jammu Tawi constituted the sample. Both institutions and subjects were selected by random sampling procedure.

## Tool

Temperamental traits of the subjects were measured by 'Dimensions of Temperamental Scale' developed by Dr Chadha and Chandana (1984). There are 152 items covering 15 traits, namely, sociability (A); ascendant (B); secretiveness (C); reflective (D) impulsivity (E); placid (F); accepting (G); responsible (H); vigorous (I); cooperative (J); persistence (K); Warmth (L); aggressiveness (M); tolerance (N) and toughminded (O). The subject is required to respond to each item in 'Yes' or 'No'.

Test-retest and split-half reliabilities of the scale were found out. The test-retest reliability co-efficients with an interval of 25 days to an unselected sample of 100 subjects for all dimensions of the scale were found to be in the range of 0.81 to 0.94. The test-retest reliability for the whole scale was found to be 0.94. The split-half reliability found out in case of even-odd items was 0.76 and for the first-second halves was 0.79. Both these reliabilities were recorded as significant which indicated that the scale is highly consistent and reliable.

The validity of the scale was established with the help of two techniques (1) cross-validation, and (2) empirical validity. The cross validity for all the dimensions



was found between the range of 0.71 and 0.92 and overall cross-validations found to be 0.81. These coefficients were noted to be positive and highly significant. Empirical validity with external criterion, i.e. 'Thorndike dimensions of temperament' was found to be 0.73, which was significant at .01 level.

### *Data Collection*

To measure the temperamental traits, the scale of Chadha and Chandna (1984) was administered on the subjects. The subjects were asked to respond to the items as 'Yes' or 'No'.

Item measuring of a particular trait or dimension positively and responded as 'Yes' was given a score of one. The negatively worded item was given a score of 'zero' for the true response and a score of one for the false response. The higher the score, the higher was the subject on that dimension or trait. The scoring was done with the help of the scoring key provided by the authors of the scale.

Academic achievement was taken in terms of percentage of aggregate marks obtained by each subject in his/her final Class XII examination. The marks were noted from the academic records of the respective institutions.

### *Statistical Analysis*

To study the relationship between 15 traits of temperament and academic achievement, two statistical techniques were employed. These were (i) Pearson's Product Moment Method, and (ii) 't' test.

## RESULTS

The obtained coefficients of correlation between the scores of temperamental traits and academic achievement are presented in Table 1.

TABLE 1			
Coefficients of Correlation Between Traits of Temperament and Academic Achievement (N=100)			
S.No.	Traits of Temperament		Level of Significance
1.	Sociability	0.135	NS
2.	Ascendant	0.127	NS
3.	Secretiveness	0.023	NS
contd. ...			

1	2	3	4
4.	Reflective	0.007	NS
5.	Impulsivity	0.071	NS
6.	Placid	- 0.173	NS
7.	Accepting	0.115	NS
8.	Responsible	0.278	*
9.	Vigorous	0.049	NS
10.	Cooperative	- 0.003	NS
11.	Persistence	- 0.159	NS
12.	Warmth	0.178	NS
13.	Aggressiveness	0.064	NS
14.	Tolerance	- 0.002	NS
15.	Toughminded	0.112	NS

\*Significant at .01 level

NS = Not Significant at .05 level.

Table 1 shows that correlations between traits of 'sociability', 'ascendant', 'secretiveness', 'reflective', 'impulsivity', 'placid', 'accepting', 'vigorous', 'cooperative', 'persistence', 'warmth', 'aggressiveness', 'tolerance' and 'toughminded', on the one hand, and academic achievement, on other, were not found to be significant at .05 level of confidence with 98 degrees of freedom. Fourteen traits of temperament were not found related with the academic achievement of the subjects. Thus fourteen null hypotheses were accepted for the relationships of temperamental traits and academic achievement.

Table 1 further reveals that the coefficient of correlation ( $r=0.278$ ) obtained for the relationship of 'responsible' trait of temperament and academic achievement is positive and significant at .01 level. This indicates that there is a positive relationship between 'responsible' trait of temperament and academic achievement of the students. This may be further interpreted to mean that high level of 'responsible' trait produces high level of academic performance and low level of 'responsible' trait results into low level of academic performance. Hence it may said that null hypothesis in this case was rejected.

To examine further the relationship between temperamental traits and academic achievement, mean differences in temperamental traits of high and low achieving groups were analyzed by using 't' tests. The high and low academic achievement groups of subjects were formed on the basis of 27 per cent top and 27 per cent bottom scores on distribution of academic achievement, respectively, following

the technique of Kelley (1939).

The obtained results with regard to 't' tests are given in Table 2.

S.No.	Traits of Temperament	High Achievers (N=27)		Low Achievers (N=27)		't'
		M	SD	M	SD	
1.	Sociability	7.15	2.39	7.04	2.32	0.172
2.	Ascendant	5.70	1.51	5.26	1.95	0.936
3.	Secretiveness	5.07	1.49	4.55	1.62	1.212
4.	Reflectiveness	5.81	1.68	5.59	1.66	0.484
5.	Impulsivity	3.44	0.99	3.41	1.09	0.106
6.	Placid	5.78	1.99	6.41	1.93	1.181
7.	Accepting	4.18	1.05	3.67	1.33	0.920
8.	Responsible	6.74	1.86	5.29	1.76	2.94**
9.	Vigorous	8.41	1.99	8.04	2.32	0.63
10.	Cooperative	10.24	1.97	10.26	1.82	0.52
11.	Persistence	4.85	1.38	5.29	1.67	1.047
12.	Warmth	11.52	1.71	10.52	2.36	1.78
13.	Aggressiveness	5.67	1.59	5.18	1.63	1.118
14.	Tolerance	6.185	1.68	6.0	1.54	0.422
15.	Toughminded	3.44	1.10	3.37	1.31	0.213

\*\*Significant at .01 level

It is evident from the above Table that high and low achieving groups did not show any significant difference in the mean scores of 'sociability', 'ascendant', 'secretiveness', 'reflectiveness', 'impulsivity', 'placid', 'accepting', 'vigorous', 'cooperative', 'persistence', 'warmth', 'aggressiveness', 'tolerance' and 'toughminded' traits of temperament as no 't' value came out to be significant with reference to the mean difference of these traits. Thus 14 null hypotheses were accepted.

However, it is clear from the Table that high achieving group of students has significantly higher value of mean scores of 'responsible' trait than low achieving group of students. The obtained 't' value (2.94) was found to be significant at .01 level of confidence. Hence the null hypothesis in this case was rejected.

In view of the above it may be stated that out of 15 traits of temperament only one trait, i.e. 'responsible' was found to be significantly related with academic achievement. It may be presumed that high achieving students have higher level of 'responsible' trait and low achieving have low level of 'responsible' trait.

On the whole, the traits of temperament were not found to be significantly related with the academic performance of the students. This may be justified in the light of the conclusions of Collins (1958) that temperamental traits bear little relation to intelligence. Since academic achievement is a manifestation of intelligence, no relations between traits of temperament and academic achievement seems to be natural. But studies conducted by Kagan (1965) and Messer (1970) reported positive relationship between 'reflective' trait and academic achievement. This finding is not in consonance with the finding of the present study

## SUGGESTIONS

The results of the study suggest that a further study be conducted by taking a larger sample of the students to confirm the results of the present study.

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*Identification and Remedy of Difficulties in Learning Fractions  
with Programmed Instructional Material*

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**M**ATHEMATICS occupies a key place in the curriculum of our educational system in the present age of automation and computers. Its dimensions and domains are relevant to and cut across almost all disciplines. Therefore, it is absolutely necessary these days to acquire an adequate knowledge of mathematics. Our National Policy of Education (NPE)-1986 has laid a greater emphasis on the education of mathematics right from the school stage.

Owing to the traditional position of the '3R's, i.e. Reading, Writing and Arithmetic at the elementary stage, a considerable proportion of school time is allotted to Arithmetic. The time allotted to Arithmetic periods in the time-table during the day seems to be most favourable for concentrated work. It has also occupied a prominent place in the 'Scholarship Examinations' taken at the age of ten or eleven to the extent of fifty per cent of the written examinations. A child learns the basics of calculations and computations of complex terms in its easy life.

The aim of this study was to inculcate in children the habit of learning 'Fractions' on their own with the help of 'Programmed Instructional Material'. This material helped the children to learn at their own pace—slow or fast. It, thus, reduced individual differences, which the teacher in a classroom might not do so easily. It also made the children independent as they had to work on their own to solve the Arithmetic problems posed to them. The fear and anxiety of the children learning mathematics were amply reduced by the material, as it provided spaced review in order to guarantee high order to success.

STATEMENT OF THE PROBLEM

The present study tested the effectiveness of the Programmed Instructional Material as a remedial teaching tool. The teacher faces many difficulties while teaching a class of 40 to 50 students. He cannot pay attention to each and every child in such a big class. The student also is not free to vary his/her own rate of learning. In the traditional method of teaching, a student is threatened by the

task as there is no proper provision for feedback in this method of teaching. Thus, we see there are many problems in the traditional method of classroom teaching. All these problems can be removed to a greater extent by the use of programmed instructions.

Our examination system is such that a student gets pass marks even if he/she has many learning difficulties/deficiencies. His/her deficiencies or learning difficulties remain unremoved in that particular class. He/she enters the next class with all these difficulties and deficiencies. In the next class more deficiencies may be added to the previous ones. In this way the difficulties and deficiencies may get accumulated over the years which are not identified and hence unremoved at any stage of their schooling. The present study provided a 'Book-Format Programme' for such students.

#### OBJECTIVES OF THE STUDY

The following were the objectives of the study:

- i. To develop 'Programmed Instructional Material on Fractions' for students of Class V.
- ii. To use programmed instructional material as a remedial tool.
- iii. To test the effectiveness of programmed instructional material in classroom teaching for students of Class V.
- iv. To test the significance of difference between the Traditional Method of Teaching and Teaching through Programmed Instructional Material.

The investigator, in the present study, was concerned with the identification of difficulties of students of Class V on the topic 'Fractions' with the help of Diagnostic Test and to remove them with self-constructive Programmed Instructional Material.

#### HYPOTHESIS

The following research hypothesis of the study was formulated and tested.

There is a significant difference in performance between the Traditional Classroom Teaching Method and teaching through Programmed Instructional Material.

#### THE PROCEDURE

A sample of 50 students was selected from two M.C.D. Primary Schools of Karol Bagh, New Delhi — (Twenty-five students from each school).

This study had the following four basic procedural features.

- i. Pre-treatment procedure
- ii. Treatment proper procedure
- iii. Post-treatment procedure
- iv. Data analysis procedure

Some highlights of these procedures go thus:

The pre-treatment procedure covered the description of preliminaries, pre-treatment assessment with the help of criterion tests for selecting participants for Programmed Instructional Material and the method of assigning subjects to the Experimental Group and the No-treatment Control Group. It also included the number of Criterion Tests used as pre-test with their description of contents. Four Criterion Tests were administered to the students on four consecutive days.

The treatment procedure included the preparation of a programmed unit on 'fractions', stages of administration of Programmed Instructional Material, instructions given to the subjects and precautions taken before providing Programmed Instructional Material.

Preparing a programmed unit included the following steps:

- i. Study of the syllabus
- ii. Review of the aims and objectives of the topic
- iii. Defining the pre-requisite skills
- iv. Decision regarding the type of programming to be used
- v. Writing draft frames
- vi. First try-out and then revision
- vii. Criterion evaluation of the draft frames
- viii. Classroom try-out

After one week of the final treatment session, the subjects in both the 'Experimental' and 'Control' Groups were re-administered the four criterion tests to obtain criterion measures on the efficacy of Programmed Instructional Material.

The data analysis procedure described the gestalt of the study. Pre-test was conducted on both the Experimental and Control Groups. The experimental Group was given the treatment, i.e. provided with Programmed Instructional Material whereas the Control Group was left without any treatment. Then post-test was administered on both the groups. Their Gain-Scores were calculated on the post-test.

#### RESULTS AND INTERPRETATION

The procedure employed in the analysis of the data is enumerated below:

- i. The investigator found out whether there was a significant difference



between the two groups, namely, the Experimental and Control Groups or not.

- ii. Means and Standard Deviations of the gain scores of the two groups on post-test were calculated.
- iii. The significance of difference between the gain scores on post-tests of the Experimental and Control Groups was tested.

The significance of difference between the Gain Scores of the two groups was tested at .05 level and at .01 level by applying t-test.

Mean of Experimental Group	=	36.16
Mean of Control Group	=	41.68
Standard deviation of Experimental Group	=	14.976
Standard deviation of Control Group	=	13.841
Standard Error of difference between Means	=	4.162
Calculated Value of 't'	=	1.326
Degrees of freedom	=	48
Value of 't' at .05 level for 48 df.	=	2.017
Value of 't' at .01 level for 48 df.	=	2.696

The value of 't' = 1.326, calculated from the data is less than the tabulated value of 't' = 2.017. Therefore it is inferred that there was no significant difference between the means of the two groups at .05 level.

Mean and standard deviation of the Gain Scores of the Experimental and Control Groups were calculated on the post-test. The gain scores were computed by subtracting the pre-test scores from the post-test scores of the students.

Mean of Gain Scores of Experimental Group	=	28.92
Mean of Gain Scores of Control Group	=	14.08
Standard deviation of Gain Scores of Experimental Group	=	8.55
Standard deviation of Gain Scores of Control Group	=	6.27
Standard Error of difference between Means	=	2.12
Degree of freedom	=	48
Calculated value of 't'	=	6.99

From the table:-

Value of 't' at .05 level for 48 df = 2.017

Value of 't' at .01 level for 48 df = 2.696

The value of 't' calculated from the data is more than the tabulated values of 't', 2.017 and 2.69 at .05 and .01 levels, respectively. Thus it can be inferred that the difference between the Gain Scores of the Experimental and Control Groups are highly significant.

There was a significant difference on the performance of the students by teaching through the Traditional Method and Programmed Instructions. Hence the research hypothesis was retained, i.e. "There was a significant difference in performance between the Traditional classroom teaching method and teaching through Programmed Instructional Material",

#### FINDINGS

The main findings of the study were as follows:

- i. Teaching and learning through Programmed Instruction can definitely help the students and teachers.
- ii. From the interpretation of the data collected, it can be safely inferred that the students receiving Programmed Instructional Material did better in post-test as compared to the other group.
- iii. Programmed Instructional Material worked effectively as a remedial tool.
- iv. Programmed Instructional Material not only helps the students to learn better but also helps the teacher to know how the students learn better

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### *Intelligence and SES as Co-relates of Academic Performance: Some Field Evidences*

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**T**his paper attempts to measure the contribution of intelligence (IQ) and Socio-Economic Status (SES) in determining academic achievement. The analysis is based upon a field study of 535 students whose IQ scores and SES status scores were regressed with their Class X examination results of M.P. Board (1987-88). The IQ scores were obtained by administering Jalota's Intelligence Test and the SES score on a modified version of the S.P. Kulshrestha SES Scale\* in both urban and rural sample. In a sample of 535 students, 179 belonged to two higher secondary schools of tribal blocks of Harrai and Amarwara in District Chhindwara (M.P.) and the rest from 14 higher secondary schools in city of Bhopal.

#### ANALYSIS

The results were obtained by multivariate regression analysis. The type of regression equation which we tried is:

$$\bar{X}_1 = B_{12.3} X_2 + B_{13.2} X_3$$

\* Modified to make it relevant in the present context.

Where  $X_1$  = Criterion Variable (Class X Board Results)

$X_2$  = Intelligence Scores

$X_3$  = SES

$N = 535$

(1) Academic Performance

$$M_1 = 52.37$$

$$\sigma_1 = .945$$

$$r_{12} = 0.666$$

(3) Socio-Economic Status

$$M_3 = 105.81$$

$$\sigma_3 = 41.915$$

$$r_{23} = 0.182$$

2) General Intelligence

$$M_2 = 85.24$$

$$\sigma_2 = 20.140$$

$$r_{11} = 0.386$$

$$R = 0.407$$

$$b_{12} = 0.374$$

$$b_{13} = 0.093$$

Putting the actual value of B weights in the equation, the results of the regression equation are as under:

$$\bar{X}_1 = 0.631X_2 + 0.316X_3$$

$$R^2 = 0.542$$

From the values so obtained it could be stated that partial  $r$ 's of regressed variable ( $X_1$ ) on independent variables were found to be significant at 0.05 level of confidence. So was the case of  $b$ 's co-efficients. It will be interpreted that IQ contributes 63.1 per cent in the variance of academic performance if partialled out independently. On the other hand, variance in academic performance due to the influence of SES factor is 31.6 per cent. How much is the contribution of IQ and SES when these two variables are combined? Multiple  $R^2$  value is 0.542, hence it could be interpreted that the combined weight or influence of IQ and SES on academic performance is 54.2 per cent.

#### HOW DOES A STUDENT'S PLACE OF STUDY SIGNIFY?

It is a matter of further enquiry how far location (a student's place of study) does determine academic performance. This part of analysis was done by correlation and significance between the two co-relations, i.e. urban versus rural locations of students in the observed sample. This analysis has been done through critical ratio (CR).

The results of the analysis are shown below:

Significance of Partial  $r$ 's

URBAN AREA			RURAL AREA		
Partial $\gamma$	Value	Significant	Value	Significant	
$\gamma$ 12.3	0.748	Significant	0.629	Significant	
$\gamma$ 13.2	0.081	Not significant	0.124	Not Significant	
$\gamma$ 23.1	0.169	Not significant	- 0.001	Not significant	

The above table shows that the relationship between academic performance and SES holding constant, the effect of IQ is not significant both in the urban and the rural area. Similarly, the relationship between IQ and SES holding constant, the effect of academic performance is also not significant both in the urban and rural areas. However, the relationship between academic performance and IQ<sub>1</sub> when the effect of SES is held constant, is found to be significant both in urban and the rural area. So, whether there is a significant difference between the co-relation of academic performance and IQ in the urban and rural areas, is further tested. These co-relations and CR are as under:

URBAN AREA		RURAL AREA
$\gamma$ 12.3	0.748	0.629
N	356	179
CR	2.33	

The CR is more than 1.96, hence it is significant at 0.05 level. Based on the evidence, there is a significant difference in the co-relation between academic performance and IQ for Class X students belonging to urban and rural schools.

#### EDUCATIONAL IMPLICATIONS OF THE ANALYSIS

It is necessary to examine and work out educational implications from the regression and critical rates analysis. Before making educational implications explicit and posit them into a general policy frame, it is also worthwhile to analyse the data further between rural and urban segments. The following table provides the mean of the disaggregated data.

TABLE Determining Mean Intelligence and Academic Performance of Rural and Urban Areas on the Basis of Socio-Economic Status			
<i>Rural</i>	SES	IQ	AP
	High	96.44	58.06
	Middle	87.75	52.32
	Low	78.68	45.18
<i>Urban</i>	High	88.66	60.61
	Middle	79.50	58.94
	Low	69.75	47.32

In order to see whether there exists any difference in academic performance (mean average) in relation to SES Categories and Intelligence, the following points could be deduced from the table:

1. There appears to be linear relationship between IQ and academic performance. The Mean of IQ scores are higher with the higher socio-economic status and taper off as SES mean declines. It holds good both for rural and urban students.
2. Similarly, academic performance in relation to SES also has a linear correspondence. This position also holds good for both rural and urban students. It means that students with higher SES status have also higher mean percentage in academic performance. The lower the SES, the lower is academic performance.
3. Another significant finding from the table is related to higher mean of IQ score amongst rural students (for all SES categories) as compared to urban students. This is contrary to the expected observation.
4. It is also to be observed that inspite of higher mean IQ scores by SES categories amongst rural students, the academic scores are lower, as compared to a contrary situation obtained from their counterparts.

This indicates that students who belong to rural areas, though having a higher IQ, may not achieve higher mean academic performance. The reasons for such a situation could possibly be:

- 1 Weak educational inputs in terms of physical facilities or un-utilised physical facilities due to weak leadership and management.

2. Poor curriculum transactions in the classroom due to weak organisational climate of the school.
3. Indifferent/passive attitude of students towards studies for lack of motivation resulting in poor class interaction.
4. These weaknesses may be existing at a point of time or may be accumulating over a period of time.

#### POLICY IMPERATIVES

Since this study establishes strong association between IQ and SES for academic performance, it implies that academic performance can be improved by social support measures besides good schooling. SES status is not controlled by school paradigm. It lies outside school climate. So is the level of innate intelligence. However, academic performance can be improved through effective curriculum transactions and all necessary support in terms of finance, organisation, management, academic matters may be provided to such schools which are vulnerable to poor academic performance.



### *Factor Content of the Minnesota Teacher Attitude Inventory in Hindi*

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THE Minnesota Teacher Attitude Inventory (MTAI) developed by Cook, Leeds and Callis (1951) is the most popular such inventory and as shown in various researches it is the best indicator of teachers' attitudes toward children. Callis (1953) conducted a study to test the efficiency of the MTAI in predicting interpersonal relations in the classroom. He found that the MTAI can predict the kind of interpersonal relations which will exist in the classroom about as well as one can predict academic performance by use of intelligence tests.

The MTAI has been translated into other languages representing different cultures. But the questions arises, does it measure the same thing after translation as does its English version? In other words, are the attitudes of teachers in different cultures similar? Or, are the attitudes of teachers in different cultures comparable when measured by the same instrument? But before answering this question it is necessary to find out exactly the attitudes measured by the MTAI in each culture.

To find out the dimensions of teacher attitudes as measured by the MTAI, Yee and Fruchter (1971) conducted a study. They came up with five significant factors which are similar to the factor structure of Horn and Morrison (1965). As the subjects in this study were in-service teachers with an average of about ten years of teaching experience, the authors claim that the five factors may be considered more stable than if they were based on the responses of pre-service candidates as in the case of Horn and Morrison's study. They also claim that the inventory's construct validity can be clearly defined and is verifiable through the five factors.

In a comparable study, Bhushan (1974) collected data from teachers of French Canadian culture. The responses of the 509 items were intercorrelated and factor analyzed using the principal factor method. Five significant factors were extracted and were orthogonally rotated, involving the varimax solution. The resulting five factors were compared with the five factors of the English version. Neither empirical techniques nor subjective comparison showed any perfect correspondence between the factor structures of attitudes of the two cultures. The subjective comparison which indicated a better correspondence showed that nearly 50% of the contents were common to the two cultures. Quebec is surrounded by an English-speaking population and the system of education in Quebec is not much different from the rest of North America's. Therefore, there was much similarity in the attitudes of teachers of two different cultures. The systems of education as well as cultures of eastern countries are quite different. Therefore, it is suspected that the attitudes of teachers of these countries will be quite different. But before any comparison is made, it is necessary to find out a valid instrument to measure the attitudes of teachers of that country. This research was intended for this purpose. More specifically the purpose of this research was to find out the factor content of the Minnesota Teacher Attitude Inventory administered to teachers in India.

#### METHOD

The Minnesota Teacher Attitude Inventory was translated into Hindi, a major language of India. The translated version of the MTAI was translated back into English by another person to check that the translation was correct. The discrepancies between the original and the back translated versions of each item were discussed



by the translators to find the correct translation. The final translated version was administered to 475 higher secondary school teachers in 20 different schools selected randomly.

The responses of the teachers were scored with a new logical scoring key (Yee and Kriewal, 1969). This key provides a five-step set of weights per item for the range from most favourable to least favourable response, (that is, +2, +1, 0, -1, -2), and ranges from a possible top score of +300 to a bottom score of -300 on the resulting scale. The authors claim that the new key was found to provide slightly higher internal consistency, equivalent validity with pupils' and principals' ratings used as criteria, and a frequency distribution that was not significantly skewed with a greater spread of extreme scores than the original key.

The responses to the 150 items were inter-correlated and factor analyzed using the principal factor method. Three significant factors were extracted and were orthogonally rotated involving the varimax solution.

## RESULTS

Factor loadings, means and standard deviations of the three factors are presented in Tables 1, 2 and 3. Items with factor loadings of .36 or greater are reported. The level .36 was chosen since this is the minimum value at which the items did not overlap on the scales. A total of 80 items had loadings of .36 or greater and were used to define the three factors. The three factors accounted for 27 per cent of the total variance.

Factor I contains 28 items. This factor expresses pupil's autonomy in a narrower sense and gives more weight to the teacher's authority in the class. Items involving concepts such as: more freedom, give reasons for the restrictions,

TABLE 1  
Factor I  
Pupil's Autonomy versus Teacher's Authority

Item Number	Factor Loading	Mean	Standard Deviation	Item Number	Factor Loading	Mean	Standard Deviation
31	.36	1.24	0.81	108	.41	0.74	1.07
42	.36	0.85	1.11	110	.39	0.66	1.07
57	.37	0.89	0.99	124	.58	1.26	0.94
70	.39	1.25	1.02	127	.46	0.87	0.97

*contd.*

Item Number	Factor Loading	Mean	Standard Deviation	Item Number	Factor Loading	Mean	Standard Deviation
71	.55	1.17	0.82	128	.50	1.03	0.97
72	.39	0.94	1.10	133	.53	0.98	1.01
78	.48	0.96	0.90	136	.59	1.09	0.91
85	.53	1.23	0.98	138	.43	0.93	1.00
86	.47	1.23	1.06	142	.41	1.15	0.85
89	.39	0.80	0.88	143	.45	1.11	0.81
100	.55	1.33	0.88	144	.51	1.11	0.87
101	.52	1.04	0.92	146	.37	0.58	1.13
103	.53	1.04	0.97	147	.36	0.48	1.18
104	.57	1.21	0.97	150	.40	0.99	0.95

TABLE 2							
Factor II							
Conflict Between Teachers' and Pupils' Interests							
Item Number	Factor Loading	Mean	Standard Deviation	Item Number	Factor Loading	Mean	Standard Deviation
34	.37	-0.22	1.35	117	.41	-0.13	1.22
39	.38	-0.48	1.22	119	.47	-0.38	1.27
41	.40	-0.47	1.22	121	.47	0.18	1.16
66	.36	0.16	1.23	122	.40	0.04	1.11
67	.42	-.27	1.08	123	.52	-0.36	1.23
83	.36	-0.04	1.20	129	.36	0.31	1.21
87	.37	-0.51	1.30	130	.39	0.38	1.04
91	.38	0.43	1.13	131	.43	0.08	1.09
92	.37	0.45	1.10	132	.53	-0.49	1.27
93	.44	-0.20	1.26	134	.48	-0.09	1.23
99	.40	-0.12	1.27	135	.52	-0.38	1.23
106	.41	-0.15	1.42	137	.39	0.23	1.04
109	.38	0.16	1.18	139	.37	0.29	1.21
113	.47	-0.24	1.21	148	.44	0.06	1.17
114	.42	0.22	1.16	149	.46	-0.14	1.22
116	.38	0.37	1.14				

TABLE 3  
Factor III  
Strict Discipline and Obedience in Handling Pupils

Item Number	Factor Loading	Mean	Standard Deviation	Item Number	Factor Loading	Mean	Standard Deviation
12	.39	0.90	1.18	49	.41	0.44	1.27
13	.39	0.92	1.24	51	.45	0.80	1.09
14	.36	0.15	1.32	54	.45	0.26	1.25
15	.36	1.13	1.09	55	.39	0.62	1.15
18	.39	-0.24	1.30	58	.41	1.18	0.98
23	.46	0.71	1.17	75	.46	0.00	1.27
27	.41	-0.03	1.37	82	.38	0.36	1.37
30	.38	-0.14	1.19	84	.39	0.48	1.20
36	.43	0.33	1.21	95	.38	0.21	1.25
47	.41	0.71	1.17	134	.39	-0.09	1.23
48	.36	0.98	1.12				

the right to disagree openly, etc., indicate that the teacher favouring these statements respects for pupil autonomy. But the items involving concepts such as: feel guilty for misbehaviour, permission to leave the class, told what to do, stand when reciting, problems of conduct, not mature to make decisions, made aware of what is expected, etc., indicate that the teacher favouring these statements maintains his/her authority in the class. Negative scores on this factor suggest that the teacher does not agree to allowing freedom to the children and does not keep his/her authority over the students. The means and standard deviations of the items given in Table 1 indicate that Indian teachers agree very strongly with the statements. Most of the means are greater than one and most of the standard deviations are around one. It means Indian teachers do allow narrow freedom to the students but at the same time keep their authority over them. Therefore, this factor is titled "Pupil's Autonomy versus Teacher's Authority".

Factor II contains 31 items. This factor has items with positive as well as negative means. It indicates that the teachers agreed with some of the statements but disagreed with the rest. The items of this factor are of such a nature that agreeing on some and disagreeing on others still measures the same concept. The statements such as: who fail to prepare their lessons should be kept after school, too many activities lacking, no business asking questions about sex, young people

are too frivolous, will not think for themselves, too easy time and not learn to do real work, not practical to base school work upon children's interest, who bites his nails needs to be shamed, no excuse for the extreme sensitivity, not meeting school standard should be dropped, etc., if favoured, will suggest a teacher's negative attitude towards children's interests. On the other hand, the statements such as; pupils should not respect teachers any more than any other adults, given more freedom in the classroom, shortcomings can be overlooked, uninteresting and difficult subjects do the most good, etc., if not favoured, will also indicate a conservative attitude of the teacher. The contents of this factor give the concept of conflict between Teachers' and Pupils' Interests. The means of the items of the factor indicate that the Indian teachers do have conflict with pupils' interests.

Factor III contains 21 items. This factor emphasizes strict discipline and obedience in handling pupils as is indicated by the statements: obey the teacher without hesitation, difficult to understand, great emphasis upon keeping order in the classroom, do not make adequate effort to prepare lessons, should be taught to obey an adult, lack productive imagination, teacher knows best, increased freedom creates confusion, not expected to be sympathetic, discipline problems are the teacher's greatest worry, lack common courtesy toward adults, should be seen and not hear, no child should rebel against authority, aggressive children are the greatest problems, should not tolerate use of slang expressions, should not expect talking privileges when adults wish to speak, etc. Agreeing with the statements will suggest that the children should be disciplined and should obey the teacher without questioning. The teacher is concerned about such things as discipline problems, aggressive children, use of slang, lack of application, classroom rules and regulations, writing obscene notes, etc. Most of the means of the items of this factor are positive and the standard deviations are around one. It shows that on the whole the Indian teachers agree with the statements of this factor, although there is a great variation.

The factor structure of the present study is based upon little more than fifty per cent of the items. Items that are not included in the factor content may have low reliability and may not have common content with other items. Moreover, there are several items measuring the same content but some are included in the factor structure of one culture. It can also happen if the factor analysis is repeated for the same culture but on a different sample.

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### *Changing Pattern of Parent-Child Relationship Perception at Different Age Levels*

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CHANGE is the eternal law of nature. It is synonym for development. However, this process of change is dependent and influenced by multiple factors. For the children, family is the very first school and parents are the first teachers. Curriculum of this first school, is the values, rituals, or directions to give the children anchors or guides to behaviour. When everything is undergoing a change, this school, these teachers and this curriculum, are also bound to be relegated to background, with the advent of time, giving place to newer schools, changed teachers and different curriculum. Hence the change in parent-child relationship perception also seems imminent, with the advancing age, though this change will be affected and influenced by many factors, namely, sex, place, innate characteristics, etc.

The family is a dynamic complex of interacting systems, in which each individual plays a unique role. These roles are complimentary and reciprocal and either rigidly or loosely defined. A particular child's role depends upon such factors as age, sex, personality and ordinal position (Dorothy Rogers — Child

Psychology 1969). The attitudes, values and behaviour of parents towards their children clearly influence patterns of development. Likewise, children's characteristics influence parental attitudes and behaviour (Frank and Wagnalls Child Psychology New Encycl. Vol. C). Park (1978) suggests a recognition of balanced reciprocity in parent-child interaction, in place of original overemphasis of parent effects (Hoffman 1970) to present overemphasis of child effects (Chapman, Bell etc.) So at present, the most rationale view is a recognition of balanced reciprocity in parent-child interaction (Parke 1978, Baumrind 1980). Long (1941) observed that reaction of parents towards the behaviour of children was determined upon and decided by the situation, in which that behaviour occurred and also by age, sex and ordinal position of the child.

### OBJECTIVES

In the light of the above context, the researcher has attempted to codify and formulate change of pattern in parent-child relationship, if any, with the change of age and sex, amongst students of District Tehri Garhwal and District Uttarkashi of Garhwal Himalayas of Uttar Pradesh.

### SAMPLE

The sample of the present study comprised of 240 pupils of Class VIII, studying in different Intermediate Colleges of the Tehri and Uttarkashi Districts. The stratified random sampling was followed. The sampled pupils are described as below.

		Age Levels in Years			
		+12	+13	+14	+15
1.	Boys	30	30	30	30
2.	Girls	30	30	30	30
Total		60	60	60	60

### INSTRUMENT

For estimating the parent-child relationship, the PCRQ, developed by R.A. Singh (1981) was administered. It consists of six 10-item scales which were prepared to denote specific and observable parental behaviours, which are loving dominating, rejecting, protecting, punishing and disciplining. A separate but identical form

for both Mother (M-Form) and Father (F-Form) was prepared for Hindi-medium pupils. The 'Yes-No' response categories were provided and summed up to yield scores for each scale assigning 1 and 0 marks, respectively, but in case of negative items, the order of scoring was reversed. The internal consistency reliability computed with Spearman-Brown formula ranged from .59 to .82. The age of the students was taken from the school records and exact age on the date of administration of the test was calculated.

#### PROCEDURE

Every sampled student was administered the PCRQ in single classroom session, with instruction to recall their parent's behaviour and answer each item in the respective PCRQ. The answered questionnaire sheets were collected and scored as stated above. Thus the obtained data were systematised for different age levels for boys and girls.

#### RESULTS AND DISCUSSION

The data were computed on means and standard deviation for different age groups, and to test the significance of difference, 't' test was administered. The results found significant only were detailed out in different tables.

TABLE 1 Comparison of Boys and Girls of Different Age Groups on Perception of Parent-child Relationship					
AGE=12+	Boys		Girls		
M-Form	Mean	SD	Mean	SD	t
Dominating	7.09	1.65	6.07	2.10	2.26*
Rejecting F-Form	8.03	2.21	6.35	2.04	3.23**
Rejecting	7.75	2.49	6.54	1.68	2.52*
AGE=13+					
M-Form					
Disciplining	7.00	1.80	5.88	1.98	2.54*
F-Form					
Rejecting	5.97	2.10	7.56	2.28	3.00**
Punishment	7.65	1.44	6.35	1.62	3.51**
AGE=15+					
F-Form					
Dominating	6.06	1.95	7.00	1.29	2.3*

Value of t\*\* significant at .01 level.

Value of t\* significant at .05 level.

Table 1 shows that at the age of 12, the boys perceived their mothers more dominating and rejecting, in comparison to girls; but the mean difference in dominating dimension was found significant at .05 level, which clarifies that the difference in 95 per cent cases was due to experimental treatment, whereas difference in the rejecting dimension was found significant at .01 level. In case of father-child relationship, significant difference resulted only in case of rejecting behaviour, which was significant at .05 level.

The girls and boys, at the age of 13+, perceived their mothers disciplining, while the perception of fathers' relationship was found significant on the rejecting and punishment dimension of behaviour.

At the age of 14+, no significant difference was noticed, although there existed some mean difference between perceptions of mothers' and fathers' behaviour, but the difference was not found significant at any level.

The boys and girls, at the age of 15, perceived their fathers more dominating and the mean difference obtained was significant at .05 level

TABLE 2 Trend of Parent-child Relationship at Different Age Levels (Girls)				
Age	12+ Mean	13+ Mean	14+ Mean	15+ Mean
<i>M-Form</i>				
Loving	8.87	9.25	8.59	8.57
Dominating	6.07	6.07	6.54	6.96
Rejecting	6.35	6.82	6.44	7.47
Protecting	7.56	7.56	7.28	7.31
Punishment	6.44	6.35	5.50	5.20
Disciplining	7.56	5.88	7.46	7.37
<i>F-Form</i>				
Loving	7.19	9.34	8.59	9.21
Dominating	6.63	6.91	6.54	7.00
Rejecting	6.54	7.56	6.82	7.47
Protecting	7.18	7.56	7.00	7.94
Punishing	6.75	6.35	5.80	6.53
Disciplining	7.18	7.37	7.56	6.53

The above table states the trend of parent-child relationship at different age levels, on different dimensions of behaviour, as perceived by the girls.

In case of mother-girl relationship, the girls perceived mothers' more loving behaviour at the age of 13+ while perception of dominating behaviour increased with the age and the girls perceived their mothers most dominating at the age



of 15+. The girls felt more rejected at the age of 15+ while most protected at the age of 12+ and 13+. The girls perceived decrease in the punishing behaviour of the mothers with the increase in age. Disciplining behaviour of the mothers was found maximum at the age of 12 and 14 years. In the Indian context, this change could be because of the fact that with increase in the age of girls, mothers start treating them as enough grown-ups to impose restrictions upon them, in a bid to prepare them fit for future family responsibilities.

Mean scores on the loving dimensions of father-daughter relationship was found to be increasing with age. It shows that the girls perceived their fathers as more loving and affectionate with increase in age, which also supports the psychological dictum of opposite-sex. The girls perceived their fathers more dominating at the age of 13+ and 15+. It could be because the father is the principal decision-taker in most of the families. The girls felt more rejected and protected behaviour of the father at the age of 13+ and 15+, which shows that the father's concern about the girl's safety was more.

Scores on the punishing and disciplining dimension of father's relationship was decreasing with age, which shows that girls become more disciplined with age.

TABLE 3  
Trend of Parent-child Relationship at Different Age Levels (Boys)

Age	12+ Mean	13+ Mean	14+ Mean	15+ Mean
<i>M-Form</i>				
Loving	9.71	8.68	8.03	8.00
Dominating	7.09	6.44	6.40	6.22
Rejecting	8.03	6.82	7.00	7.00
Protecting	8.03	7.46	7.31	7.03
Punishing	6.25	5.79	6.38	6.06
Disciplining	6.72	7.00	6.69	6.85
<i>F-Form</i>				
Loving	8.96	8.50	8.44	8.57
Dominating	7.09	6.10	5.56	6.06
Rejecting	7.75	5.96	6.80	7.00
Protecting	7.84	7.56	7.72	7.47
Punishing	6.25	7.65	5.45	6.06
Disciplining	7.37	7.56	6.59	6.53

From the above table it is clear that with increase in age, there is a decreasing trend of scores on the loving dimension of parent-child relationship.

Mean scores on the perception of the dominating, rejecting, protecting and punishing dimensions of behaviour of mothers with boys was also found decreasing with age, which shows the child's tendency of independence and avoiding interference.

The boys perceived increased disciplining behaviour of mothers, at the age of 13+ and 15+ years. The boys perceived decreasing trend of scores on the loving, dominating and rejecting dimensions of father-child relationship. With increase in age, the boys perceived less protecting, punishing and disciplining behaviour of fathers. All this results from the fact that at this age, the child starts spending too much of time in school and in the company of the peers. The child develops a sense of adequacy in self, which reduces the need for parental direction. The child begins to condemn any supervision by parents. As a result, the parents begin to pay less attention to the child and gradually find themselves less intimately involved with him.

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## Book Reviews

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**Microcomputer in School Education — A Handbook for Teachers**  
S.S. Raghavan, Prentice Hall of India Private Limited,  
pp 100+vii, 1990, Rs 25.00.

**C**OMPUTER Literacy and Studies in Schools (CLASS) Project, launched in 1984 on pilot basis, has made a beginning of computer-assisted teaching/learning in the country, though its major emphasis was on computer literacy. Since then, teachers and teacher educators have been experimenting use of computers in teaching and learning at the school stage. This created a need for books on this subject so as to share experiences of developed countries and adopt them to the need of the country. Large number of books on the subject were imported to meet this requirement.

The imported books dealt with a wide spectrum of the subject. Most of the imported books organised the contents based on the current hardware and software technology of their country. These technologies are much more advanced than what are available in India. Even if these are available, their cost is beyond the means of schools. Consequently, the contents of these books are, generally, beyond the perception of the readers. A book based on the available technology in the country was therefore very much needed. The book under review meets this requirement.

The book organised into seven chapters, covers use of computers in teaching/learning, educational software development, computer language and application of artificial intelligence in education. In addition to this, appendices in the book

contain programme listing and useful references.

Chapter 1, Introduction, besides presenting the organisational structure of the book, addresses to the three important aspects of computer education, viz, necessity of computers in school education, superiority of computers viz-a-vis other available teaching aides and role of teachers in computer education. Deliberations on these aspects are quite brief and are based on practical considerations. At places, quotations from prominent educationists, like Seymour Papert, have been used to bring home the point.

The major emphasis in the book is on computer in classrooms which is covered in two chapters, i.e. Chapters 2 and 3. In the former chapter, various computer-based learning/teaching modes are discussed and illustrated with the help of software packages available in schools under the CLASS project. This is a specific feature of the book due to which it scores over the other foreign books available in the country. The discussion in Chapter 3 confines to teaching and learning situations wherein database, spreadsheet and word processing software can be used effectively. In this chapter also, the software referred to are available in schools. Further, the identified curricular activities are drawn from Indian school curricula. This is why the utility of the book enhances considerably than that of imported books. The readers can test the ideas presented in the book and are encouraged to experiment their own ideas.

Computers capabilities in process control and data capture are taken up in Chapter 4. These applications in conducting science experiments in laboratories are illustrated with the help of three experiments. The appendices provide programme listings required for these experiments.

The process of development of educational software is a little more complicated than that of business software. The objectives and goals to be achieved in the case of business software are objectively definable and are achieved. Whereas in education, the emphasis is on selecting the most suitable process for attaining the specified objectives. Teachers, teacher educators and curriculum experts have to share major responsibility in developing quality educational software and they have to be conversant with this process. Chapter 5 deliberates in this area covering definition of specifications, design, coding and evaluation aspects.

Chapter 6 covers LOGO, Pascal and Authoring programming languages. The coverage of the languages is quite sketchy and may acquaint readers with broad features of each.

The last chapter on artificial intelligence attempts to illustrate scope of its applications in education. The subject is still at the development stage although intelligent tutorial systems are being experimented in developing countries. Like other books on the subject, the chapter presents some achievements and some prospects realisable in the near future.

Barring a few, most of the illustrations and discussions in the book are centered around teaching of science subjects. Perhaps, the author's background of software available in schools might be the cause for this bias. However, the book under review scores over several imported books on the subject on two accounts. The most prominent one is that the illustrations are taken from what is actually happening in schools in the country. Further, the book is confined to pragmatic aspects only and has skillfully avoided pedagogical issues.

R.R. SAXENA

### **Education and Manpower Planning**

Devendra Thakur (Ed). Deep and Deep Publications,  
New Delhi, 1990, pp 491,  
Rs. 425.00.

**P**LANNING is an important instrument of national development. In education it helps in deriving maximum utilization and avoiding under-utilization or non-utilization of resources. It thus helps in maximising the attainment of desired ends. Manpower planning changes unskilled into skilled and transforms raw human material into human resources/manpower required for economy in right proportion. Thus, it provides corrective measures for obtaining a balance between the output of the educational system and the input for productive purposes

Manpower planning in education is an institutional need. It is also an administrative problem since it is the responsibility of the administrative authorities to supply an adequate teaching force with different types of education, training and experience to meet the national demands at different levels of education, taking into consideration the educational policy and programmes.

The book comprising 41 essays, besides introduction, is divided into five sections, each dealing with a significant aspect of education. Section I concentrates on primary and secondary education. Its opening chapter highlights educational innovation in the third world with reference to democratisation of education and

alternative development in education. The remaining five chapters refer to the Indian educational scenario. One of these relates to elementary education for all — quantitative expansion, targets and multiple approach to achieve the same. Four research studies have also been reported. A study dealing with the time spent on supervision of girls' schools in the state of Uttar Pradesh reaffirms that supervisors should devote more time and energy to make academic supervision more effective and efficient. The second study concludes that effective utilisation of educational radio requires systems approach. On the basis of the findings of another study, suggestions to improve the quality of I-TV programmes are made. The last study of this section states that suitable structures and procedures are adopted for the implementation of the scheme of nutritious meal programme in Tamil Nadu.

From primary and secondary education in Section I, one moves to higher education in Section II. It is stated that higher education is beset with problems, such as rising enrolment, soaring expenditure, high staff-student ratio, high drop-out ratio, etc. Higher education should respond to the needs of the society as well as strike a balance between quality of opportunity and diversity of societal needs. Issues centring around the system of higher education in China and India have been discussed. How and under what conditions a new town was built by and for university — LOUVAIN-LA-NEUVE (BELGIUM) too is described. Unit cost of analysis of higher education in India has been studied. State of affairs in Colleges of Science and Humanities, objectives and programmes within the existing conditions of the agricultural universities have also been examined. A few studies of revaluation of papers at post-graduate level in a few universities, evaluation of teachers by students, attitudes of students to higher education and selection of courses of studies by pre-university students have shown interesting results. A case for decentralisation of powers of an academic administrator, demand and financing a higher education in Canada, teaching English by correspondence, training programme in question, writing for college teachers, admission to universities, dilemma of economic versus educational viability in higher education, decision-making and autonomy in university administration are other significant issues which have been taken up in this section.

Section III deals with different aspects of adult education and mass literacy. Adult literacy movement has been launched to enable adult illiterates to become literate and perform social functions effectively and efficiently. Adults have to be properly motivated and their interest sustained. Form (languages) and content (learning) are two important facets of this programme. For successful implementation of the programme, it is essential to have multiple agency involvement. Curriculum and materials needed for adult literacy should not only aim at providing literacy but its retention too. Economy should be used in

designing different aspects of the programme and production of instructional material by different writers and curricular resource centres. Materials need to be functionally oriented, and problem based. In fact, adult education activities should prepare an individual to participate in community life and have self-fulfilment. Teachers teaching adult illiterates need different types of training programmes to serve different levels of workers.

Instructional media and instructional aids to be used have to be decided by the teachers keeping in view the specific objectives and unique characteristics of the learner. In fact, the programme needs professionalism and proper system to obtain impressive results. To help neoliterates to contribute to national development and communicate effectively, basic materials have to be prepared according to some accepted methodology. To achieve all this is a big challenge.

Section IV deals with evaluation techniques. Modules of programme evaluation and problems related to programme evaluation are described. Six strategies of institutional evaluation and their limitations have been examined. Selection of a strategy depends on the appropriateness of the situation and how best it can be initiated and managed. Merits and demerits of central evaluation as well as complementary occupations for rural students and villagers are highlighted.

The book is full of ideas written in simple language. Its value could have been enhanced by including themes directly concerning educational planning and management. The book will interest a wide range of people—experts, professionals, planners, teacher educators, students and research scholars.

N. SABHARWAL





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# Indian Educational Review

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**NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING**

## INDIAN EDUCATIONAL REVIEW

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## Learning Disabilities Among Elementary School Children—Influence of Sex, Age and Religion

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Madras*

F. Z. AFIAH

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**L**EARNING disability represents a discrepancy between a child's estimated academic potential and his or her actual level of academic potential. There are many children who do not do well in school, many children who have difficulty in learning but are not all learning disabled. According to a law passed by the US Congress in the year 1969, "Children with specific learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or using spoken or written language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling

or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do not include learning problems which are due primarily to visual, hearing or motor handicaps, to mental retardation, emotional disturbance or to environmental disadvantage."

Learning disabilities are generally recognized as the "newest" of the handicapping conditions in terms of their recognition in public schools and related special educational programmes. The field of learning disabilities is relatively new but it is growing at a phenomenally rapid rate. In India the term 'learning disabilities' is a new term and is yet to be recognized. The term 'backward' is commonly used in place of the term 'learning disabled'. Hence there is a need to differentiate between backward and learning disabled children. Backward children are found to be academically weak in all aspects whereas the learning disabled child may be weak in one or two school subjects. Hence the present study is a step in the direction of identifying the learning disabled and assessing their ability in those aspects such as reading, writing, spelling, language, arithmetic. It also attempts to investigate the interactions between age, sex and religion with reference to learning disabilities among elementary school children.

#### METHOD AND MATERIALS

##### *Hypotheses*

The following hypotheses were framed and examined in the present study:

1. *Learning Disabilities and Age* : Age will not have any bearing on the elementary school children's disability in  
(a) reading, (b) arithmetic, (c) language, (d) writing, and (e) spelling
2. *Learning Disabilities and Sex* : Sex will have an influence on elementary school children's disability in  
(a) reading, (b) arithmetic, (c) language, (d) writing, and (e) spelling
3. *Learning Disabilities and Religion* : Religion will influence the elementary school children's disability in  
(a) reading, (b) arithmetic, (c) language, (d) writing, and (e) spelling.

##### *Sample*

The total sample comprised of 150 subjects (male = 75 ; female = 75) of



ages 8, 9 and 10 years. There were five boys and five girls in each age-group. They belonged to three religions, that is, Hindus, Muslims, and Christians.

### *Tools Used*

1. In order to assess the chief cognitive processes of which children under eleven years of age are usually capable, Coloured Progressive Matrices (Raven, 1977) was used.

2. Gray Oral Reading Test (Gray, 1967) was used to measure the growth in oral reading and also for diagnosing oral reading difficulties.

3. Peabody Picture Vocabulary Test (Revised) by Dunn and Dunn (1981) was administered to children to measure their receptive (hearing) vocabulary for Standard American English. In this sense, it is an achievement test, since it shows the extent of English vocabulary acquisition. As it provides a quick estimate of one major aspect of verbal ability, it is a scholastic aptitude test.

4. Compass Diagnostic Test in Arithmetic (1929) was used to measure the ability of children in the fundamental operation of addition and assess their arithmetic disability.

5. Jones's Spelling Scale was used to diagnose the child's disability in spelling.

6. Standard Scale for Judging Handwriting by Truman Gray was used for judging handwriting of learning disabled children.

Information about independent variables, namely, age, sex, and religion of the child was collected from the school records. After establishing rapport with the subjects, testing was carried out during school hours in the mornings when the child is usually most alert.

### RESULTS AND DISCUSSION

#### 1. *Learning Disability and Age :*

Table 1 gives the means and standard deviations for the five disabilities

TABLE I										
Age	Reading Disability		Arithmetic Disability		Language Disability		Writing Disability		Spelling Disability	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
8+	1.42	0.29	205.3	76.4	27.6	9.3	64.5	7.8	50.3	16.2
9+	1.63	0.35	228.6	82.3	33.3	10.2	70.6	8.4	73.8	17.4
10+	2.2	0.39	260.9	86.3	43.65	10.9	77.0	9.4	94.4	18.2

In order to find out whether the observed differences in all the five learning disabilities, were significant or not, ANOVA was carried out and the results are presented in Table 2.

TABLE 2 Effect of Age on Learning Disabilities					
	Source	df	SS	MSS	F-ratio
1. Reading Disability	Between Groups	2	16.29	8.14	66.75**
	Error	237	17.94	122.00	
	Total	239	34.25		
2. Arithmetic Disability	Between Groups	2	13572.5	6786.25	1.04NS
	Error	237	670512.5	6500.13	
	Total	239	644085.0		
3. Language Disability	Between Groups	2	6620.3	3310.13	33.46**
	Error	237	15467.0	105.22	
	Total	239	22087.3		
4. Writing Disability	Between Groups	2	3907.0	1953.5	26.13**
	Error	237	10988.0	74.5	
	Total	239	14985.0		
5. Spelling Disability	Between Groups	2	48690.3	24345.1	79.8**
	Error	237	44822.0	304.91	
	Total	239	93512.3		

\*\* Significant at one per cent level.

Table 1 discloses that the mean scores of 8+ ( $\bar{x} = 1.42$ ), 9+ ( $\bar{x} = 1.63$ ) and 10+ ( $\bar{x} = 2.2$ ) are increasing and there is significant difference among three age-groups with respect to reading disabilities; ( $F = 66.75$ ;  $p < 0.01$ ,  $df = 2$ ). Since the calculated F-ratio is higher than the table value, it may be inferred that age has a definite effect on the reading disabilities of elementary school children. Hypothesis I (a) is accepted.

It is observed from Table 1 that the 10+ age-group scored the highest mean ( $\bar{x} = 260.9$ ), followed by 9+ ( $\bar{x} = 228.6$ ) and 8+ ( $\bar{x} = 205.3$ ). ANOVA revealed no significant difference among the mean scores of 8+, 9+ and 10+ age-groups with respect to arithmetic disability. Since the calculated F-value is less than the table value (4.61), it may be inferred that age has no effect on arithmetic disability. Thus, hypothesis I (b) is rejected.

Table 1 shows that the mean scores for language disability increased from 8+ ( $\bar{x} = 27.6$ ) to 9+ ( $\bar{x} = 33.3$ ) to 10+ ( $\bar{x} = 43.65$ ). Significant difference ( $F = 31.46$ ;  $p < 0.01$ ,  $df = 2$ ) was observed among the three age-groups tested.

with respect to language disabilities. It may be inferred that age has a marked influence on the language disability of the learning disabled. Hypothesis I (c) is accepted.

It can be observed from Table 1 that the mean scores for writing disability follow an increasing trend from 8+ ( $\bar{x} = 64.5$ ) 9+ ( $\bar{x} = 70.6$ ) and 10+ ( $\bar{x} = 77.0$ ). The calculated F-value for writing disability ( $F = 26.13$ ) is much higher than the table value (4.61) at one per cent level of significance. Therefore, it may be concluded that age has a definite effect on the writing disability of the learning disabled. Hypothesis I (d) is accepted.

Table 1 further shows that the mean scores of the 10+ age-group ( $\bar{x} = 94.4$ ) is much higher than the 9+ ( $\bar{x} = 73.8$ ) and 8+ ( $\bar{x} = 50.3$ ) age-groups. Significant differences are found among the three age-groups with respect to spelling disabilities. The F-ratio (79.8) is found to be much higher than the table value (4.61). It may be concluded that age has a definite bearing on the development of spelling disabilities. Thus hypothesis I (e) is accepted.

## 2. Learning Disability and Sex

Table 3 gives the means, standard deviations and 't'-value for the five learning disabilities.

TABLE 3 Effect of Sex on Learning Disabilities					
Learning Disability	Boys		Girls		't'-value
	Mean	SD	Mean	SD	
1. Reading Disability	1.7	0.33	1.8	0.38	1.72NS
2. Arithmetic Disability	236.6	78.1	226.7	85.4	0.74NS
3. Language Disability	34.9	9.6	34.8	10.7	0.06NS
4. Writing Disability	68.2	11.9	73.2	3.6	3.48**
5. Spelling Disability	68.9	17.7	70.1	16.3	0.43NS

NS : Not Significant

\*\*Significant at one per cent level.

The results in Table 3 indicate a very small difference in the mean scores of boys ( $\bar{x} = 1.7$ ) and girls ( $\bar{x} = 1.8$ ) with respect to reading disability. There is no significant difference between boys and girls in their reading disability ( $t = 1.7$ ; NS). As far as reading disability is concerned, the learning disabled

boys and girls belong to a homogenous sample. Hypothesis II (a) is rejected.

It is clear from Table 3 that there is no significant difference between the boys ( $\bar{x} = 236.6$ ) and the girls ( $\bar{x} = 226.7$ ) with regard to their arithmetic disability as the calculated *t*-value (0.74) is much less than the table value. It may be inferred that sex has no bearing on the arithmetic disability of the learning disabled. Hypothesis II (b) is rejected.

Table 3 further shows that there is very slight difference between the boys ( $\bar{x} = 34.9$ ) and the girls ( $\bar{x} = 34.8$ ) in their language disability. As the calculated *t*-value (0.06) is much less than the table value, it may be concluded that the boys and the girls do not differ in their language disability. Hypothesis II (c) is rejected.

It can be seen in Table 3 that the mean scores for writing disability of the girls ( $\bar{x} = 73.2$ ) is higher than the boys ( $\bar{x} = 68.2$ ). The observed difference between the learning disabled girls and boys was statistically significant ( $t = 3.48$ ;  $p < 0.01$ ). It may be inferred that sex has a definite bearing on the writing disability of the learning disabled. Hypothesis II (d) is confirmed.

A close inspection of Table 3 shows that the girls' mean scores for writing disability ( $\bar{x} = 70.1$ ) are slightly higher than those of the boys ( $\bar{x} = 68.9$ ). However, the observed difference failed to reach the statistical significance ( $t = 0.43$ ). It may be inferred that the learning disabled girls and boys do not differ from each other with respect to their spelling disability. Hypothesis II (e) is rejected.

### 3. Learning Disability and Religion

Table 4 gives the means and standard deviations for the five disabilities.

TABLE 4										
Religion	Reading Disability		Arithmetic Disability		Language Disability		Writing Disability		Spelling Disability	
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
Hindus	1.76	0.32	232.3	82.3	35.9	9.6	69.8	7.6	70.6	16.8
Muslims	1.72	0.36	230.6	80.3	34.2	10.2	72.3	8.3	66.1	17.2
Christians	1.76	0.34	231.9	85.6	34.35	10.8	69.8	9.4	71.8	17.6

In order to examine whether religion plays a significant role in all the five learning disabilities, ANOVA was carried out and the results are presented in Table 5.

TABLE 5  
Effect of Religion on Learning Disabilities

Learning Disability	Source	df	SS	MSS	F-ratio
1. Reading Disability	Between Groups	2	0.06	0.03	0.13NS
	Error	237	34.17	0.23	
	Total	239	34.23		
2. Arithmetic Disability	Between Groups	2	81.0	40.5	0.009NS
	Error	237	644004.5	4380.98	
	Total	239	644085.5		
3. Language Disability	Between Groups	2	83.28	41.64	0.28NS
	Error	237	22004.02	149.69	
	Total	239	22087.3		
4. Writing Disability	Between Groups	2	216.2	108.1	1.08NS
	Error	237	14679.4	99.85	
	Total	239	14895.6		
5. Spelling Disability	Between Groups	2	933.44	466.72	0.74NS
	Error	237	92578.86	629.79	
	Total	239	93512.3		

NS; Not Significant.

Table 4 shows that the differences in the mean reading disability scores of the Hindu ( $\bar{x} = 1.76$ ), Muslim ( $\bar{x} = 1.72$ ) and Christian ( $\bar{x} = 1.76$ ) learning disabled children are very small. ANOVA reveals that religion has no significant difference on the reading disability of the learning disabled children. Since the calculated F-value (0.13) is much less than the table value (4.61) it could be inferred that religion has no effect on reading disability. Thus, hypothesis III (a) is rejected.

It may be seen in Table 4 that the Hindus scored higher mean values ( $\bar{x} = 232.3$ ), followed by the Christians ( $\bar{x} = 231.9$ ) and the Muslims ( $\bar{x} = 230.6$ ). It is evident that religion has no effect on the arithmetic disability of the learning disabled children as the calculated F-value (0.009) is much lower than the table value (4.61). Hypothesis III (b) is not accepted.

Table 4 shows that the mean scores for the language disability of the Hindus ( $\bar{x} = 35.9$ ) is slightly higher than the Christians ( $\bar{x} = 34.35$ ) and the Muslims ( $\bar{x} = 34.2$ ), F-ratio (0.28;  $df = 2$ , NS) reveals that there is no significant difference in the mean scores of the three religious groups on language disability. It may be inferred that religion has no effect on the language disability of the learning disabled children. Thus, hypothesis III (c) is rejected.

Table 4 further discloses that the Muslims scored relatively higher mean score ( $\bar{x} = 72.3$ ) while both the Hindus and the Christians scored equal mean value ( $\bar{x} = 69.8$ ). ANOVA reveals that religion has no influence at all on the writing disability of the learning disabled children as the calculated F-value (1.08) falls short of the table value. Hypothesis III (d) is not confirmed.

Again, Table 4 reveals that there is not much of difference in the mean spelling disability scores of the Hindu (70.6), Muslim (66.1) and Christian (71.8) learning disabled children. It may be inferred that religion has no influence at all in the spelling disability of the children as the calculated F-value (0.74) falls short of the table value. Therefore, hypothesis III (c) is rejected.

#### DISCUSSION

The findings of the study on learning disabilities among elementary school children with reference to age, sex and religion are discussed below.

##### 1. *Learning Disabilities and Age*

It is observed from the results that age has a significant influence on reading disability among elementary school children. This result is substantiated by a study conducted by Lomax (1983) who compared 101 learning disabled in the age-group 8-10 years. The results indicate that some proficiency in the work recognition ability and reading comprehension was found. There were significant differences in the reading ability among the three groups.

It is found from the results that age has no definite effect on arithmetic disability. Further, the result is substantiated by a study conducted by Alice (1985) who studied 22 learning disabled children in the age-group 9-12 years. They had significant deficit in Maths achievement. These students were given tests of numbers, substance, quantity and weight. Significant group differences appeared indicating that many learning disabled students had not yet developed these concepts even in the upper elementary years.

It has been proved by the results that there is the effect of age on language disabilities among elementary school children. This study is substantiated by a study conducted by Richard (1984) on learning disabled to find out the extent of their vocabulary. By administering PPVT-R he found that the vocabulary of these children was far below the normal expected for that age-group. He observed that a Grade V child's vocabulary was estimated at Grade IV or III level only. This proves the vast significance that the learning disabled children exhibit in their vocabulary tests.

The results obtained from the study prove the effect of age upon writing disability among elementary school children. This finding is substantiated by

a study conducted by Freeman and Nystrom (1977) who evaluated handwriting by using the Ayres Handwriting Scale which offered samples of handwriting ranging from scores of 10-90 in quality with grade norms for the number of letters per minute. They offered schedules of specific diagnostic measures covering such points as slant, spacing, irregularities, colour or shading, form of letters, size and beginning and ending of strokes. Many of these deficiencies were found among the learning disabled children and are treated in regular classroom programmes.

An observation of the results reveals significant effect of age on spelling disabilities among elementary school children. The above finding is substantiated by a study conducted by Nichols (1984) who devised a test for the analysis and correction of spelling difficulty, consisting of subtest on spelling achievement, proof reading, word meaning, visual discrimination. Remedial instruction was instructed for 4 months on a group of 173 third grade pupils out of a total of 423 or 41 per cent who fell below the average. It was concluded that the test was effective in analyzing spelling errors and in determining the effectiveness of remedial instruction.

## *2. Learning Disabilities and Sex*

The results of the study indicate the influence of sex on reading ability. This result is substantiated by a study conducted by Charles Silberman (1970) who observed reading disabilities as rampant, teachers are demoralized, drugs circulate even in grade schools, racialism is widespread, truancy is the rule, and boredom is everywhere. He further went on to compare reading disabilities among boys and girls and found that both groups performed on the same level in the reading tests administered to them. But he also concluded that the reading level of these children was definitely below average and they lacked perceptual and linguistic experience in the years before entering school.

The results showed that significant differences existed between the males and females, responses to the aspect of arithmetic difficulties. In many schools, arithmetic is no longer a step-by-step march through adding, subtracting, multiplying, fractions, and percentages. It appears that the new ways used in teaching the 'new maths' are far more effective than the older ones in giving children a real understanding of numbers and their uses. It is apparent that both the sexes, irrespective of age-group, commit equal number of mistakes. Sometimes they fail to solve simple addition problems and hence they lag behind other children who are able to solve these problems in a much easier way.

It is observed from the results that there are small differences between males and females responses on language ability. Language development is an important entity which grows along with the child. As the child grows older, his experiences widen and give him ample opportunities to learn and improve

his vocabulary. It is commonly found that both the sexes, irrespective of the age-group, gain a vocabulary which is found to be below average for that particular age-group.

The results obtained from the study prove the effect of sex on writing disability among elementary school children. This finding is substantiated by a study conducted by Donald (1970) on learning disabled children. He administered the Ayres Handwriting Scale to 30 boys and 30 girls of Grade V. The findings proved that girls performed better than boys. Girls proved to be more legible and clear in their writings than boys.

The results indicate a mild difference between boys and girls' responses to the spelling test among elementary school children. Spelling is an encoding process. The speller mentally selects and graphically records appropriate letters, inaccurate sequence, to represent the sounds of the message he wishes to convey to a reader. Additionally, spelling calls for tactile and kinesthetic skills involved in using the tools and materials for spelling. Hence it is apparent that sex does not have an influence on the spelling ability of a child. But, on the whole, his general spelling ability is found to be below average than what is expected of that age-group.

### *3. Learning Disabilities and Religion*

The results of the study indicate no effect of religion on reading ability among elementary school children. Reading instruction at successive levels includes diagnosing their reading achievement, continuing readiness procedures, increasing their sight vocabulary, developing further ability in independent word identification. In a classroom there are children of all religious groups. All the children, irrespective of their religions, get equal opportunities to learn to read and write. Hence if one group commits mistakes, it is likely that other group will also commit the same number of mistakes in reading. Hence religion plays no role in either increasing or decreasing reading ability among children.

The study further indicates that there is no effect of religion on arithmetic ability among elementary school children. The aura of difficulty in which this subject is too often clothed may in itself create anxiety or intensify anxieties already present. Arithmetic functioning requires a relatively long span of attention with a maintenance of a high degree of concentration. Any anxieties that the child may be experiencing will reduce his span of attention and ability to concentrate, thereby interfering with Arithmetic ability. Hence we find that religion has no role to play in either enhancing or decreasing Arithmetic ability in the child.

It has been proved by the results that there is no effect of religion on language disabilities among elementary school children. The vocabulary of a child is such an entity that it depends on his own individual effort in trying



to gain a wider vocabulary. The level of vocabulary in a child depends on his capacity to learn and also on its capacity to retain the vocabulary and use it at the appropriate occasions. Hence, irrespective of the religion he belongs to, the vocabulary of the child shows no significant differences.

The results obtained from the study prove that there is no effect of religion on writing disability among elementary school children. It has been argued that handwriting is positively or inversely related to intelligence, a point of view which may build up the mental status of poor handwriters and furnish an ability for lack of effort to write well. According to the present knowledge, there should be a high correlation between intelligence and handwriting. Those who are poor in writing are below average in their general mental level in tests of associative processes. Hence the religion of the child has no role to play in writing disability among elementary school children.

The study proves that religion has no bearing on spelling disability among elementary school children. English language with its unique phonetic system offers more opportunities for mis-spelling than many other languages. In the process of teaching these errors need correction with explanation of why they are likely to occur, for those who may understand them. There should be more drill and repetition for the slow-learning when such simplified explanations fail. The ability to spell is an individualized ability and is not characteristic of any particular community or sect. Hence the number of errors committed by any particular community is balanced by the same number of mistakes by another community. Hence religion has no bearing on the spelling ability of the elementary school children.

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# Interdomain Relationship Between Intelligence and Personality and Between Creativity and Personality by Canonical Analysis

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**T**HE interdomain relationship between intelligence and personality and creativity and personality has been examined by numerous psychologists and educationists. In what follows we present a brief review of the kind of subjects used in these studies, the methodologies used and the general conclusions in respect of the interdomain relationship emerging from these studies.

## RELATIONSHIP BETWEEN INTELLIGENCE AND PERSONALITY

Numerous empirical studies have been conducted by psychologists and educationists to investigate the relationship between intelligence and personality domains. The subjects of these studies have been young and old children, adolescents, normal adult males, neurotic children, children of elementary

schools, nurses, male medical and psychiatric patients, etc. These studies have used statistical methodologies such as comparing averages, correlations and regression analysis, curvilinear relationship, analysis of variance and factor analysis. Eysenck (1947, 1952, 1959, 1971), Broadbent (1958), Callard and Goodfellow (1962), Child (1964), Rafi (1965), De (1966), Mohan and Kumar (1973) and Maqsood (1980) report that there is no relationship between intelligence and personality. However, Cattell (1945, 1946, 1950), Calvin et al. (1955), Siegman (1956), Spielberger and Katzenmeyer (1959), Feldhusen and Klausmeier (1962), Eysenck and White (1964), Eysenck (1967), Lynn and Gordon (1961), Ley et al. (1966), Madan (1968), Entwistle and Welsh (1969), Elliott (1972), Anthony (1973, 1977), Vidhu Mohan et al. (1974), Lewis (1975), Crookes et al. (1981) and Yesh Pal (1991) report the existence of some relationship between intelligence and personality. The study by Matarazzo et al. (1954) reports both kinds of results. Thus the various studies conducted to explore/test the relationship between intelligence, on the one side, and extraversion and neuroticism/anxiety, on the other, indicate that there is no clear-cut simple relationship between these two domains.

## RELATIONSHIP BETWEEN CREATIVITY AND PERSONALITY

Some of the earlier works in the fields of creativity-personality relationship are those by Hargreaves, Cattell, Allport, Goldstein, Maslow et al., Roe and Terman. Some other studies conducted to probe the relationship between personality and creativity have been by Roe (1946, 1951, 1952), Terman (1954), Munsterberg and Mussen (1953), Drevdahl (1954), Cattell and Drevdahl (1955), Guilford (1959), Sinnott (1959), Gough (1961), Getzels and Jackson (1962), Barron (1955, 1957, 1962, 1963, 1968), Mackinnon (1962, 1965, 1967), Torrance (1962), Seitz (1964), Taylor and Holland (1964), Trowbridge and Charles (1966), Schaefer (1969), Chambers and Barron (1978), Helson and Crutchfield (1970), Taft and Gilchrist (1970), Parloff (1972), Schaefer (1973), Halpin et al. (1974), Bergum (1973, 1974, 1975), Gakhar (1975), Hecovar (1976), Shelton and Harris (1979), Amos (1981), Petraiteete (1981) and Yesh Pal (1986, 1991).

These studies have been conducted on artists, painters, physicists, eminent scientists, professional academic scientists, science as well as art students, creative adolescents, art children, writers, architects, creative women mathematicians, etc. The methodology used included various scales such as ACL, CPI, What kind of Person Are you? Test, TTTT Abilities, MMPI, Barron's Originality Scale, etc. The results of these studies show that there are numerous kinds of personality traits associated with different kinds of creatives and it is

perhaps very difficult to conclude about a single set of uniform personality traits of some kind of creatives.

## METHODOLOGY AND RESEARCH QUESTIONS

### *Methodology*

In order to study interdomain dimensions between (i) intelligence and personality, and (ii) creativity and personality, the following statistical procedures are available:

*Procedure-1:* One can examine all the correlations across the two sets of variables (say,  $P_1, P_2$  ( $P_1 \leq P_2$ )) in number, i.e. the matrix of correlations  $R_{12}$ . These correlation coefficients can be tested for their significance and appropriate inferences (interpretations) can be drawn from these results.

*Procedure-2:* A second method is to proceed with the multiple correlation/regression (MCR) procedure.

*Procedure-3:* The correlation matrix of all the measures belonging to the two domains (sets) may be subjected to some factor analytic procedure (s). The factors are examined with respect to the size of loadings and only those factors are treated as interbattery factors that have some significant loadings on both sets of variables.

*Procedure-4:* The correlation matrix of the two sets of variables may be subjected to canonical correlation analysis (CCA).

*Procedure-5:* One can resort to some interbattery factor analysis (IBFA) procedure [Tucker (1958), Horst (1965), Kristof (1967)]. This would give us only interbattery factors.

Procedure-1 has its own limitations. Individual examination of all the  $P_1 \times P_2$  (even for moderate sized numbers  $P_1$  and  $P_2$ ) correlations do not enable one to formulate the total idea about the extent and nature of interrelationships of domains. This is due to the fact that the tests of simultaneous inference to study correlations have not been devised. In Procedure-2, each variable (measure) of one battery\* (say, of  $P_1$  variables) is regressed in the space of all the other variables (say,  $P_2$ ) of the other battery and vice-versa. In each regression equation, regression weights squared multiple correlations, etc. are examined and a decision taken to the effect that such and such predictor variables help in explaining the predictor variable. In totality, this procedure involves a unified comprehension of  $P_1$  and  $P_2$  regression coefficients (weights) and

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\* domain

probably all the more in case redundancy and suppression among the predictor variables are also considered.

Procedure-2 involves the use of some interbattery factor analytic (IBFA) technique (s). This approach is of recent origin and logically based on factorially analysing the correlation matrix,  $R_{12}$  of the across battery variables. Horst (1965) and Gorsuch (1974) point out that Tucker's (1958) method does not have any satisfactory test criterion to decide about the number of interdomain factors that may be treated significant. Further, while discussing the IBFA procedure due to Tucker (1958), Kristof (1967) points out that "the solution is not unique.... the rotation problem is much more difficult than in ordinary factor analysis". However, his own method of IBFA (Kristof, 1967) has also not become popular till today.

Procedure-3 is currently the most popular procedure for studying interdomain relationships. In this, some factor analytic procedure is employed upon the correlation matrix of all the measures of the combined domains and then one proceeds for analysis as is usual in the factor analytic studies.

Procedure-4, viz. canonical analysis procedure (Hotelling, 1936), is a multivariate statistical technique developed to measure the relationship (s) between any two sets of variables. This technique is a generalisation of the multiple regression technique and provides an analysis of the relations between any two psychological domains, each being measured by a number of variables. Further, this procedure is also sometimes referred to as external factor analysis [Bartlett (1948), Hotelling (1957), Kshirsagar (1978)], Horst (1961a, 1961b) generalised Hotelling's canonical analysis procedure for any number of sets of variables. It may be observed that when the variables, logically or experimentally, belong to two sets, canonical analysis may be a more preferable method as compared to the conventionally employed factor analytic technique. Further, it seems that factor analysis may be more appropriate for hypothesis generating and exploratory studies while canonical analysis may have wider applications in research involving hypothesis testing and prediction.

While recommending the use of canonical analysis procedure in studies involving an analysis of interdomain dimension, Hotelling (1957) comments, "a use sometimes made for factor analysis in the past is in testing for the relations between two sets of variates.... This kind of use of factor analysis should clearly be superseded by an examination of canonical correlations between two sets of variates".

The reasons for so strong arguments in favour of the use of CCA technique lie in the fact that it involves a complex array of useful statistics (coefficients) such as squared canonical correlations (SCC's), pairs of corresponding interrelated

factors, variances being explained by factor in each pair and 'individual' and 'total' redundancy coefficients (Love and Miller\*, 1966). These statistics conjointly help in interpreting the results and in drawing meaningful conclusions, many of which are just not at all possible with the use of the factor analytic approach because the latter is not equipped with such a host of powerful summary statistics which only the CCA has within its ambit (cf. Yesh Pal (1986, 1991)). Thus the problem of psychological interdomain relationship can be studied more appropriately and precisely by canonical analysis technique.

### *Research Questions*

The following research questions are being examined in respect of the interdomain relationship between intelligence and personality and then about creativity and personality:

1. Are there some statistically significant SCC's yielding bases for the examination of the corresponding pairs of canonical factors of intelligence and personality which may serve the purpose of interdomain dimensions?
2. Are some or all of these pairs of canonical factors psychologically (meaningfully) interpretable?
3. What is the percentage of variances that can be explained via the statistically significant canonical factors of intelligence, of the personality domain?
4. What is the percentage of variances that can be explained via the statistically significant canonical factors of personality, of the intelligence domain?
5. What is the total extent to which the variance of the measures of personality domain can be accounted for by the canonical factors of intelligence domain and vice-versa?

A set of similar questions pertaining to creativity and personality has been examined.

The factor analytic approach is obviously, by virtue of its nature itself, is incapable of probing some of such research questions, and, therefore, the use of the canonical analysis technique has been invoked in the present study.

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\* Please refer to Cooley and Lohnes (1971).

## OPERATIONAL DEFINITIONS

### *Creativity*

Creativity as defined by Torrance (1962) refers to both verbal and non-verbal creativity as measured by fluency, flexibility and originality (verbal creativity); and fluency, flexibility, originality and elaboration (non-verbal creativity). Verbal creativity is measured by Torrance Tests of Creative Thinking (TTCT) Verbal Form A (Torrance, 1966a) yielding scores for fluency, flexibility and originality. Non-verbal creativity is measured by the battery of Figural Tests of Creative Thinking (Torrance, 1966b) yielding scores for non-verbal fluency, flexibility, originality and elaboration.

### *Intelligence*

It represents both verbal and non-verbal intelligence. In the present study, verbal intelligence is being measured by Jalota and Singh's (1967) Test of General Mental Verbal Ability (2/60) which comprises seven sub-tests, viz. of number series, classification, best answer, reasoning, analogies, vocabulary and synonyms and opposites. Non-verbal intelligence is being measured by Raven's (1960) Standard Progressive Matrices. It yields one measure of non-verbal intelligence.

### *Personality*

It refers to a group of personality traits as measured by California Psychological Inventory (Gough, 1957, 1964) and Bernreuter Psychological Inventory (Bernreuter, 1935).

The California Psychological Inventory (CPI) is designed to measure eighteen personality traits. The eighteen scales of the CPI are designed to yield scores which can provide a profile representing the personality pattern of an individual.

The BPI comprises six personality scales namely, neuroticism, self-sufficiency, introversion-extraversion, confidence-in-oneself, dominance and sociability. The last two scales of the BPI have, however, not been included in the present study.

## DESCRIPTION OF DATA

The two correlation matrices of the combined domains of (i) personality and intelligence, and (ii) creativity and personality have been taken from Gakhar (1975). These correlation matrices are based on the data collected from a sample of 730 girls who had been studying in different schools of Punjab (India) in Classes IX to XI. The normality of variables and the existence of

linear relationships between all these variables had already been examined statistically.

## CANONICAL ANALYSIS OF INTELLIGENCE AND PERSONALITY

### *Results*

The canonical analysis of intelligence and personality revealed seven meaningful squared canonical correlations which are 0.264, 0.125, 0.083, 0.047, 0.025, 0.021 and 0.007; while the eighth squared canonical correlation was negative. Therefore, the number of statistically significant canonical relations cannot be decided with the aid of the statistical decision rule as recommended by Bartlett. However, 'the thumb rule' followed as an alter to Bartlett's test suggests that the first two pairs of canonical dimensions may be interpreted.

### *Discussion*

In Table 1, factor structure coefficients of the first two pairs and in Table 2, the variance and redundancy coefficients corresponding to the first seven pairs of canonical factors, are presented.

*First Pair of Canonical Factors:* Factor I in personality domain (cf. Table 1) has only marginally significant positive loadings on the two CPI scales, namely sense of well-being and communality. The sense of well-being scale measures a person's personality characteristics such as being energetic, enterprising, alert, ambitious; valuing work and making efforts for its own sake, flexibility in thought and action. This scale thus measures qualities somewhat similar to self-confidence and self-assurance. Further, the communality scale yields scores for a person's patience, sincerity, steadfastness, capacity for clear thinking, good judgement and conscientiousness. The corresponding Factor I in 'intelligence' domain (cf. Table 1) is relatively highly saturated with non-verbal and verbal abilities as measured by Standard Progressive Matrices (Raven, 1960) and Test of General Verbal Mental Ability (Jalota and Singh, 1967), respectively. The two tests being 'timed' clearly call for 'persistency', speed and power which seem to require the presence of personality characteristics such as being measured by the corresponding factor (Factor I) in personality domain.

Thus the first pair of canonical factors reveals that there exists an interdomain dimension in terms of a comprehensive dimension of general intelligence with reasonably homogeneous scatter of loadings over its measures, and a small group factor with just marginally significant loadings on personality traits of sense of well-being and communality.



TABLE I  
Factor Structure Coefficients

TABLE I Factor Structure Coefficients											
S.No.	Measures of Traits	Personality				S.No.	Measures	Intelligence			
		Notation		Factor				Notation	Factor		Factor
		I	II	I	II				I	II	
<i>CPI Traits</i>											
1.	Dominance	X <sub>1</sub>	-0.00	0.08	1.	Non-verbal Intelligence	Y <sub>1</sub>	0.41		0.08	
2.	Capacity for Status	X <sub>2</sub>	-0.15	-0.17	2.	Number Series	Y <sub>2</sub>	0.44		0.03	
3.	Sociability	X <sub>3</sub>	0.19	-0.18	3.	Classification	Y <sub>3</sub>	0.72		-0.33	
4.	Social Preference	X <sub>4</sub>	-0.03	-0.09	4.	Best Answer	Y <sub>4</sub>	0.68		-0.26	
5.	Self-acceptance	X <sub>5</sub>	0.07	-0.18	5.	Reasoning	Y <sub>5</sub>	0.78		0.55	
6.	Sense of Well-being	X <sub>6</sub>	0.40	-0.28	6.	Analogies	Y <sub>6</sub>	0.57		-0.24	
7.	Responsibility	X <sub>7</sub>	0.25	-0.30	7.	Vocabulary	Y <sub>7</sub>	0.76		-0.14	
8.	Socialization	X <sub>8</sub>	0.34	-0.16	8.	Synonyms-Opposites	Y <sub>8</sub>	0.65		-0.80	
9.	Self-control	X <sub>9</sub>	0.16	-0.19							
10.	Tolerance	X <sub>10</sub>	0.07	-0.18							
11.	Good Impression	X <sub>11</sub>	0.08	-0.17							
12.	Commonality	X <sub>12</sub>	0.40	-0.11							
13.	Achievement via Conformance	X <sub>13</sub>	0.14	-0.69							
14.	Achievement via Independence	X <sub>14</sub>	-0.08	-0.11							
15.	Intellectual Efficiency	X <sub>15</sub>	0.34	-0.14							
16.	Psychological Mindfulness	X <sub>16</sub>	-0.13	-0.21							
17.	Flexibility	X <sub>17</sub>	-0.32	0.02							
18.	Femininity	X <sub>18</sub>	-0.22	0.07							
<i>BPI Traits</i>											
19.	Neuroticism	X <sub>19</sub>	-0.26	-0.03							
20.	Self-sufficiency	X <sub>20</sub>	0.22	0.00							
21.	Introversion-Extraversion	X <sub>21</sub>	-0.28	-0.00							
22.	Confidence-in-one-self	X <sub>22</sub>	-0.29	0.02							

TABLE 2  
Variance and Redundancy Coefficients  
(All Values are Proportions)

Factor No.	Personality		Intelligence	
	Extracted Variance	Redundancy Variance	Extracted Variance	Redundancy Variance
1.	0.059	0.015	0.414	0.110
2.	0.045	0.006	0.073	0.009
3.	0.042	0.003	0.080	0.007
4.	0.055	0.002	0.086	0.004
5.	0.037	0.001	0.064	0.002
6.	0.046	0.001	0.082	0.002
7.	0.055	0.000	0.063	0.000

Total Variance Extracted = 0.328  
from Personality

Total Redundancy for = 0.028  
Personality Given  
Intelligence

Total Variance  
Extracted from = 0.862  
Intelligence

Total Redundancy for  
Intelligence Given = 0.134  
Personality

The first squared canonical correlation shows that there is 26.4 per cent overlapping variance between the corresponding pair of canonical factors.

The first pair of variance coefficients (cf. Table 2) reveals that the first canonical factor of personality extracts about six per cent of its total variance and the first canonical factor of intelligence extracts 41 per cent of its total variance. However, the corresponding redundancy coefficients show that the first canonical factor of intelligence (yielding basis for the comprehensive dimension of general intelligence) explains only 1.5 per cent variance of personality domain and the first factor of personality can explain 11 per cent variance of 'intelligence' domain. The bulk of total redundancy, which is 2.8 and 13.4 per cent of personality and intelligence, respectively, is packed in the first pair of canonical factors.

*Second Pair of Canonical Factors:* Factor II in personality domain (cf. Table 1) has quite a high significant loading on only one CPI scale, viz. achievement via conformance. The qualities associated with the high scores on this scale are a person's high level of capability, efficiency and industriousness; high valuation of intellectual activity and intellectual achievement, etc. Further,

a high scorer on this scale has higher level of motivation or need for achievement.

The corresponding Factor II in intelligence domain (cf. Table 1) has significant loadings with opposite signs on two sub-tests, namely reasoning, and, synonyms and opposites; measuring verbal intelligence. This seems to be a small bipolar common factor of some acquired or learnt mental capacities through 'experiences' of varied nature. The two sub-tests loading on opposite ends of the same psychological continuum tend to explain that persons high on verbal abilities of comprehension may not be high on relatively abstract mental verbal ability of reasoning and vice-versa.

The second squared canonical correlation indicates that there is an overlapping variance of the magnitude 12.5 per cent between the second pair of canonical factors.

The variance coefficients corresponding to the second pair of canonical factors show that only 4.5 and 7.3 per cent of the total variances of personality and intelligence, respectively, are extracted by the second pair of canonical factors. However, the second pair of redundancy coefficients reveals that nothing of the total redundancy is packed in this pair of canonical factors.

The squared canonical correlations of the remaining five pairs of canonical factors are positive. However, none of the redundancy coefficient (cf. Table 2) provides any basis for 'predictive' factors. Further, the total redundancy coefficient of personality, given intelligence, reveals that only 2.8 per cent variance of personality can be explained through all the seven canonical factors of intelligence domain, given the corresponding seven canonical factors of personality. The total redundancy coefficient for intelligence domain given personality indicates that 13.4 per cent variance of intelligence can be explained through the seven canonical factors of personality given the corresponding seven canonical factors of intelligence. Further, the redundancy coefficient corresponding to the first canonical factor of personality reveals that there is hardly any intelligence correlate of personality. However, the corresponding redundancy coefficient for intelligence supports the conclusion in respect of the existence of personality correlate of intelligence. The last six pairs of redundancy coefficients reveal that none of the corresponding pairs of canonical factors can be treated as an interdomain factor. All these in fact yield specific domain factors.

The first pair of canonical variates,\* which can be used to predict the score for the first factor of personality on the basis of the corresponding factor of intelligence, or vice-versa, are given below:

$$\eta_{\text{per}} = -0.42 X_1 - 0.56 X_2 + 0.88 X_3 - 0.53 X_4 + 0.02 X_5 + 1.34 X_6$$

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\* In these canonical variates factor pattern coefficients have been used.

$$\begin{aligned}
 &+ 0.13 X_5 - 0.34 X_6 - 0.44 X_7 - 0.38 X_{15} + 0.10 X_{11} - 0.63 X_{12} \\
 &- 0.21 X_{17} + 0.91 X_{18} - 0.24 X_{19} - 0.06 X_{16} - 0.01 X_{17} \\
 &- 0.62 X_{18} - 1.15 X_{19} - 0.44 X_{20} + 1.72 X_{21} - 1.42 X_{22}
 \end{aligned}$$

And

$$\begin{aligned}
 \eta_{int} = &0.09 Y_1 - 0.21 Y_2 + 0.30 Y_3 + 0.06 Y_4 + 0.40 Y_5 \\
 &+ 0.18 Y_6 + 0.32 Y_7 + 0.18 Y_8
 \end{aligned}$$

Where  $(X_1, X_2, \dots, X_{22})$  and  $(Y_1, Y_2, \dots, Y_8)$  denote, respectively, various measures of personality and intelligence (vide Table 1).

The results (of redundancy coefficients) support the conclusion that personality traits play a significant role in facilitating/forming the basis of convergent thinking cognitive abilities or that of the conventional concept of general intelligence, etc. However, no evidence is observed through this statistical analysis (CA) in respect of the role of intellectual abilities (general intelligence) in conditioning or bringing forth to play personality traits. Further, these results once again support Cattell's (1946) assertion that "abilities..... appear as manifestation of, or interlock with, dynamic and general personality traits".

#### CANONICAL ANALYSIS OF CREATIVITY AND PERSONALITY

##### Results

The canonical analysis of creativity and personality domains led to the extraction of six pairs of meaningful canonical dimensions having their squared canonical correlations 0.265, 0.095, 0.049, 0.032, 0.029 and 0.010. Bartlett's (1941, 1948) test of significance could not be used to determine the number of statistically significant canonical relations for the simple reason that the seventh squared canonical correlation had a negative value. However, the rule of thumb followed presently as an alter to Bartlett's test suggests that only the first two pairs of canonical dimensions are worth probing.

##### Discussion

The factor structure coefficients of the first two pairs of canonical factors are presented in Table 3 and the variance and redundancy coefficients of the first six pairs of canonical factors are given in Table 4.

*First Pair of Canonical Factors:* Factor I in personality domain (cf. Table 3) is dominantly characterized by the CPI scales achievement via conformance and the next in order of decreasing magnitude by the BPI scale 'self-sufficiency.' On this factor the two dominant scales achievement via conformance and self-sufficiency lie on the two extremes of the same psychological continuum and

TABLE 3

TABLE 3									
Creativity					Personality				
S.No.	Measures	Notation	Factor		S.No.	Measures of Traits	Notation	Factor	
			I	II				I	II
1.	Verbal Fluency	X <sub>1</sub>	-0.05	-0.09	1	Dominance	Y <sub>1</sub>	0.25	-0.03
2.	Verbal Flexibility	X <sub>2</sub>	-0.02	-0.37	2.	Capacity for Status	Y <sub>2</sub>	0.13	0.17
3.	Verbal Originality	X <sub>3</sub>	0.54	-0.32	3.	Sociability	Y <sub>3</sub>	0.20	0.28
4.	Non-verbal Fluency	X <sub>4</sub>	0.31	0.49	4.	Social Presence	Y <sub>4</sub>	0.23	0.03
5.	Non-verbal Flexibility	X <sub>5</sub>	0.28	0.73	5.	Self-acceptance	Y <sub>5</sub>	0.08	0.28
6.	Non-verbal Originality	X <sub>6</sub>	0.25	0.60	6.	Sense of Well-being	Y <sub>6</sub>	0.17	-0.04
7.	Non-verbal Elaboration	X <sub>7</sub>	0.17	0.24	7.	Responsibility	Y <sub>7</sub>	0.17	-0.09
					8.	Socialization	Y <sub>8</sub>	-0.03	0.14
					9.	Self-control	Y <sub>9</sub>	-0.00	-0.07
					10.	Tolerance	Y <sub>10</sub>	0.06	0.07
					11.	Good Impression	Y <sub>11</sub>	0.07	0.21
					12.	Communality	Y <sub>12</sub>	-0.01	-0.08
					13.	Achievement via Conformance	Y <sub>13</sub>	-0.84	0.05
					14.	Achievement via Independence	Y <sub>14</sub>	-0.01	0.22
					15.	Intellectual Efficiency	Y <sub>15</sub>	-0.23	0.20
					16.	Psychological Mindedness	Y <sub>16</sub>	0.09	0.29
					17.	Flexibility	Y <sub>17</sub>	-0.14	0.08
					18.	Femininity	Y <sub>18</sub>	-0.13	0.03
					19.	Neuroticism	Y <sub>19</sub>	-0.27	-0.12
					20.	Self-sufficiency	Y <sub>20</sub>	0.49	0.03
					21.	Inversion-Extraversion	Y <sub>21</sub>	-0.24	0.06
					22.	Confidence-in-one-self	Y <sub>22</sub>	-0.33	-0.05

TABLE 4  
Variance and Redundancy Coefficients  
(All Values are Proportions)

Factor No.	Creativity		Personality	
	Variance Extracted	Redundancy	Variance Extracted	Redundancy
1	0.083	0.022	0.041	0.011
2	0.205	0.020	0.023	0.002
3	0.055	0.003	0.030	0.001
4	0.065	0.002	0.034	0.001
5	0.100	0.003	0.072	0.002
6	0.162	0.002	0.081	0.001

Total Variance Extracted  
from Creativity = 0.670

Total Variance Extracted  
from Personality = 0.281

Total Redundancy for  
Creativity Given Personality = 0.052

Total Redundancy for  
Personality Given  
Creativity = 0.018

thus the underlying factor is of bipolar nature. According to Gough's (1957, 1964) CPI manual, the high scores on achievement via conformance scale are indicative of a person's high level of capability, efficiency and industriousness; high valuation of intellectual activity and intellectual achievement; high level of a person's persistency and effective social and thought adaptability. Also motivation or need for achievement is higher in such persons. Further, the old BPI 'self-sufficiency' is merely a combination of high self-confidence and low sociability (cf. Cronbach, 1949). Thus a self-sufficient person is characterized by the tendency to be alone, rarely asking for sympathies and encouragements and is self-confident and independent. Such a self-sufficient person has the capacity to resolve the cognitive conflict by himself and such a conflict, particularly, in the presence of high ego becomes a motivating force for his further creative thinking. The presence of such qualities in a person is capable of bringing forth to play mental processes highly characterized by unusual, uncommon, novel kind of cognitive response.

In the light of these it is much likely that the presence of such a common factor, would be accompanied by some kind of creative ability as well.

The corresponding Factor I in creativity domain (cf. Table 3) has a significant loading only on originality measure of verbal creative thinking.

abilities. Thus the conjoint/functioning of the first pair of canonical factors of 'creativity and personality' can be understood in the light of content represented by the two factors in this pair.

The squared canonical correlation of the first pair of canonical factors reveals that the two factors in this pair have an overlapping variance of the magnitude 26.5 per cent.

The factor of creativity explains 8.3 per cent of its total domain variance and the corresponding factor of personality explains 4.1 per cent of its total domain variance. Further, the corresponding pair of redundancy coefficients show that only 2.2 per cent variance of creativity domain can be explained via the first canonical factor of personality and only 1.1 per cent variance of personality domain can be explained via the first canonical factor of creativity.

*Second Pair of Canonical Factors:* Factor II in personality domain is a very 'weak' sociability factor whereas in 'creativity' domain it (Factor II) is a 'Group Factor of Non-verbal Creativity' with elaboration loading relatively much low. Further, on Factor II of creativity domain, the verbal creativity measures do not load significantly and have signs of loadings opposite to that of non-verbal creativity measures. This seems to suggest that the two verbal and non-verbal divergent thinking abilities may be of bipolar nature as well.

The second squared canonical correlation reveals that there is only 9.5 per cent overlapping variance between the corresponding pair of canonical factors.

The second canonical factor of creativity extracts 20.5 per cent of its total domain variance, whereas the corresponding factor of personality extracts only 2.3 per cent of its total domain variance. However, the second pair of redundancy coefficient indicates that two per cent variance of creativity can be explained via the second canonical factor of personality and hardly any variance of personality domain can be explained through the 'Group Factor of Non-verbal Creativity'. Thus this pair of canonical factors yields basis for the conceptualization of a personality correlate of creativity.

## CONCLUSIONS

### *Intelligence and Personality*

The total redundancy coefficients for personality and intelligence are 2.8 and 13.4 per cent, respectively (cf. Table 2), and further the bulk of total redundancy is packed in the first pair of canonical factors. The factor structure coefficients of the first pair of canonical factors (cf. Table 1) reveal an interdomain dimension in terms of a 'General Factor of Intelligence' and a group factor with just marginally significant loadings on personality traits of sense of well-being and communality as measured by the CPI.

The results of total redundancy coefficients obtained through canonical analysis seem to support the conclusion that the presence of personality attributes such as being measured by the CPI and the BPI play a significant role in forming the basis of, or facilitating, convergent thinking abilities. However, no evidence is obtained through any of the measures (involved in canonical analysis) to the fact that general intelligence can account for/facilitate or predict the operation of any or a combination of personality trait(s). The factor analytic results\* yielded some evidence as to the lack of complete independence of the two psychological realms of intelligence and personality but could not reveal whether it is the personality traits that have a determining role in convergent thinking intellectual abilities (intelligence) or vice-versa. It is here that the results of canonical analysis (CA) seem to have earned a definite edge over the factorial analysis procedures. The CA has very clearly revealed that it is the personality traits which predict 13 per cent of total variance of intelligence domain.

### *Creativity and Personality*

The sizes of the first two squared canonical correlations provided us with a basis to conceive of the existence of two pairs of interdomain dimensions between creativity and personality. An examination of squared canonical correlations, variance and redundancy coefficients of the remaining pairs (third to sixth) reveals the truth that none of these forms even a provisional basis for being an interdomain dimensional relation. However, only the first pair of factors is obtained to be of some psychological interest from the viewpoint of interdomain relationship. This pair of factors yields basis to conceive of an interdomain dimension in terms of personality traits of achievement via conformance as measured by the CPI and self-sufficiency as measured by the BPI, on the one hand; and the originality measure of verbal creativity, on the other. The two factors of this canonical pair have good overlapping variance (almost 27 per cent) between themselves. However, these have quite low predictive power if overall domain variances are considered. In fact the total redundancy coefficients (cf. Table 4) reveal that personality traits as measured by the CPI and the BPI can account for five per cent variation of the measures of creative thinking abilities (as measured by Torrance Tests of Creativity) and almost two per cent of the variance of personality measures can be accounted for by measures of creative thinking abilities. It may be observed that numerous contributors to the studies in respect of creativity-personality relationship have emphasized or attempted to identify the role of personality traits in making up

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\* The two correlation matrices subjected to canonical analysis in the present study have also been subjected to three factor analytic procedures each followed by varimax and promax rotations (cf. Yash Pal 1986, 1991a, 1991b).



of the creatives. However, the present statistical analysis (CCA) yields evidence to the fact that role of personality traits in the making-up of the creatives is only to the extent of five per cent which is quite small and suggests one to examine the role of variables other than the personality traits.

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## Perceived Organizational Conflict as a Function of Teacher's Personality

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**S**TUDIES on organizational conflict in educational setting is a recent phenomenon. When the management or organization and society impose demands on teachers and if such demands and nature of works are perfectly clear to them at each successive moment, then there is only one thing that teachers could do, i.e. do their duty. But this is often different. There are different expectations, confusing and conflicting. Therefore, conflict is faced by teachers. This conflict due to organizational structure is an interactive state which arises in an imbalanced situation between social and organizational challenges and demands that are faced by teachers. It is manifested in disagreement, differences or incapacibilities, within or between social entities, that is, individual, group and organization.

Previous researches have tried to identify and predict the factors associated with such occurrences among teachers with regard to job satisfaction (Srivastava and Gupta, 1986), personality (Bhagoliwal, 1988), role perception (Joshi, Sahoo and Mehta, 1987). In recent years attention has been focussed on the study of school environment (Fraser and Fisher, 1982; Bist, 1987; Mishra, 1986) and the teacher's stress in teaching.

The study on stress has attracted a considerable amount of interest in behavioural research (Caplan, 1972; Kasi, 1974; Jenkins, 1976; Mc Grath, 1976; Invancevich and Matteson, 1979; Beehr and Schuler, 1980). In case of teachers stress in teaching is due to the discrepancy between the teacher's capacities, needs and expectations, on the one hand, and the occupational demands and opportunities, on the other, for which many factors are responsible. They come within situational commitment, personality and occupational role preference and related factors. Herman and Gyllstrom (1977) found that stress is related to role conflict in organization. Dewey (1985) described practical application of group dynamics and Adlerian principles in the resolution of a conflict within organization. Four principles of conflict resolution were identified — practicing mutual respect, pinpointing the real issues, changing the conflict agreement and involving all concerned in decision-making.

However, organizational conflict in educational set-up could not draw much attention of educationists although it exists in every institution with varying intensity and direction. It is felt that the study on organizational conflict and its effects which was confined to industry can very well be applied to educational set-up. Organizational conflict is a useful phenomenon for study. Therefore, an attempt has been made to assess and analyse the teacher's organizational conflict and its interaction with their personality make-up.

#### OBJECTIVES OF THE STUDY

The objectives of the study were as follows:

1. To assess the teacher's locus of control.
2. To measure organizational conflict in a primary school teacher.
3. To find out the relationship between the teacher's conflict with the headmaster, senior and subordinate colleagues.
4. To study the effects of the teacher's conflict with the senior and subordinate colleagues or the headmaster.

#### DESIGN AND SAMPLE

The study was explanatory, and the sample consisted of 200 primary

school teachers. Each teacher had at least high school certificate with BT diploma, but, on an average, the sample had mostly trained graduates. The mean years of teaching experience was 2 to 15 years. The teachers were selected randomly from the elementary school system first and then were dichotomised on median split using the *III* scale.

#### TOOLS

The following tests were used in the present study:

##### *Rahim Organizational Conflict Inventory (Rahim, 1983)*

The Rahim Organizational Conflict Inventory—II (ROCI-II) is designed to measure five independent dimensions that represent styles of handling interpersonal conflict. The five independent styles of handling interpersonal conflict are:

1. Integrating (IN): This style involves the exchange of information and examination of differences to reach a solution acceptable to both parties.
2. Obliging (OB): This style attempts to play down differences and emphasize commonalities to satisfy the concern of the other parties.
3. Dominating (DO): This style identified by a win-lose orientation or with forcing behaviour to win one's position.
4. Avoiding (AV): This style is associated with withdrawal, passing the buck, or sidestepping situations.
5. Compromising (CO): It involves sharing whereby both parties give up something to make a mutually acceptable decision.

The test was used in the present study after examining its relevance to the Indian educational setting by ten experts in the fields of psychology and education. The teachers responded to each statement on a five-point rating scale. The internal consistencies are all in acceptable range varying from .67 to .77 and the test retest reliabilities reported by Rahim (1983) also ranged between .60 to .83 obtained in one-week interval. In the present study the split-half reliability varied from .70 to .83.

##### *Locus of Control Scale (Rotter, 1966)*

The Locus of Control Scale (Rotter, 1966) was developed to measure the construct of Locus of Control which was derived from Rotter's social learning theory. This scale measures the degree to which people perceive the events in their own lives as being largely the consequence of their own actions, and this being under their own control (Internal control) or beyond their own personal

control (external control). The scale is composed of 29 paired choice items. The reported reliabilities of the scale have varied from .49 to .83.

# PROCEDURE AND SCORING

The questionnaires were given to the teachers in their schools with the permission of the concerned headmaster. While giving the questionnaire, it was ensured that the teachers must not consult anybody while filling up the forms. The responses were scored according to the scoring keys.

# RESULTS

The Means and SDs for organizational conflict with the headmaster, senior and subordinate teachers were separately worked out for the teachers with ILC and ELC. To assess the significance of difference between the personality types on the teacher's organizational conflict, 't' ratios were found out and are presented in Table 1.

Table 1					
Means, SDs and 't' Ratios of ILC and ELC Teachers on Organizational Conflict Scores					
	ILC N = 100		ELC N = 100		
	M	SD	M	SD	t
<i>Organizational Conflict (Type I) Headmaster</i>					
Integrating	4.104	0.585	4.089	0.174	0.174
Obliging	3.865	0.603	3.562	0.724	3.223**
Dominating	2.812	0.954	2.447	0.917	2.765**
Avoiding	3.505	0.679	3.301	0.733	2.795**
Compromising	3.959	0.669	3.893	0.735	0.667
<i>Organizational Conflict (Type II) Senior Teachers</i>					
Integrating	4.158	0.537	4.258	0.575	1.266
Obliging	3.743	0.585	3.619	0.725	1.016
Dominating	2.706	1.036	2.413	1.009	2.021*
Avoiding	3.473	0.702	3.373	0.786	0.952
Compromising	4.117	0.574	4.179	0.627	0.729
<i>Organizational Conflict (Type III) Subordinates</i>					
Integrating	4.193	0.516	4.279	0.535	1.162
Obliging	3.750	0.713	3.648	0.734	1.000
Dominating	2.865	1.118	2.416	1.090	2.878**
Avoiding	3.654	0.637	3.309	0.746	3.520**
Compromising	3.994	0.685	4.019	0.610	0.272

\*p < .05

\*\*p < .01

df = 198



The mean values presented in Table 1 indicate that the ILC and ELC teachers vary in organizational conflict. The teachers having Internal Locus of Control (ILC) experienced significantly more obliging (OB), dominating (DO), avoiding (AV) types of conflict with their headmaster in comparison to the External Locus of Control (ELC) teachers. The 't' ratios for OB, DO, and AV organizational conflict were 3.223, 2.765, and 2.795, respectively, which are significant at .01 level. These findings indicate that the ILC teachers feel more OB, DO, and AV conflict with their headmasters in schools. The DO conflict of the teachers with their subordinates differed and it was found that the ILC teachers experience significantly more DO conflict in comparison to the ELC teachers ( $t = 2.021$ ,  $p < .05$ ). In case of the teachers conflict with their subordinates, it is observed that the ILC teachers are having more DO and AV conflict with their subordinates, in comparison to the ELC teachers. However, these conclusions are based on the Means, SDs and t ratios.

To test the differences between the teachers' conflict with their headmasters and senior and subordinate teachers, the mean differences were calculated and are presented in Table 2.

TABLE 2 't' Ratios between Organizational Conflict with Headmaster and Conflict with Senior and Subordinate Teachers as Expressed by ILC Teachers					
	Organizational Conflict (Type I) Headmaster				
	IN	OB	DO	AV	CO
<i>Organizational Conflict (Type II) Senior Teachers</i>					
Integrating	0.96	3.62**	12.35**	7.51*	2.34**
Obliging	4.35**	1.45	8.31**	2.64**	2.43**
Dominating	11.75**	9.66**	0.75	6.44**	10.19**
Avoiding	6.93**	4.26**	47.21**	0.33	5.01**
Compromising	0.16	3.04**	11.76**	6.88**	1.80
<i>Organizational Conflict (Type III) Subordinates</i>					
Integrating	1.53	4.15**	12.79**	8.09**	2.75**
Obliging	3.85**	1.24	7.88**	2.50*	2.13*
Dominating	9.81**	7.87**	0.36	4.89**	8.42**
Avoiding	5.23**	0.33	7.32**	1.60	3.28**
Compromising	1.22	1.42	10.10**	3.50**	0.36

\* $p < .05$ \*\* $p < .01$ 

df = 198

From the observation of Table 2 it is found that the ILC teachers are significantly better in IN (Type I) in comparison to OB (Type II and III), DO (Type II and III) and AV (Type I and III). The 't' ratios for OB (Type II and III), DO (Type II and III) and AV (Type II and III) were 4.35, 11.75, 6.93, 3.85, 9.83 and 5.23, respectively. The ILC teachers significantly differ in OB (Type I) in comparison to IN (Type II and III), DO (Type II and III), AV (Type II) and CO (Type II). The significance of these differences as observed at .01 level of significance. The 't' ratios were 3.62, 4.15, 9.66, 7.87, 4.26 and 3.04 for IN (Type II and III), DO (Type II and III), AV (Type II), respectively. In case DO (Type I) of the ILC teachers it is clear that the ILC teachers are better in IN (Type II and III), OB (Type II and III), AV (Type II and III), and CO (Type II and III). The 't' ratios found to be significant at .01 level were 12.35, 12.79, 8.31, 7.88, 47.21, 7.32, 11.76 and 10.10 for IN (Type II and III), OB (Type II and III), AV (Type II and III) and CO (Type II and III), respectively. With regard to the ILC teachers experience about AV (Type I) conflict, it is found that they experience more such conflict in comparison to IN (Type II and III), OB (Type II and III), DO (Type II and III), OB (Type II and III), CO (Type II and III). The corresponding 't' ratios were 7.51, 8.09, 2.64, 2.50, 6.44, 4.89, 6.88 and 3.50, respectively. The ILC teachers also significantly differ in CO (Type I) in comparison to IN (Type II and III), OB (Type II and III), BO (Type II and III) and AV (Type II and III). The observed 't' ratios for IN (Type II and III), OB (Type II and III), DO (Type II and III) and AV (Type II and III), were 2.34, 2.75, 2.43, 2.13, 10.19, 8.42, 5.01 and 3.28, respectively.

The teachers with ELC differently perceive the reinforcement and have a different outlook of the events. They believe that the resultant of any action is dependent upon luck, chance, or as unpredictable because of the great complexity of the forces surrounding them. Due to these fundamental differences the mean differences of the ELC teachers' conflict with the headmaster and senior and subordinate teachers was separately worked out. The results are presented in Table 3.

The values presented in Table 3 indicate that the ELC teachers significantly differed in IN (Type I) in comparison to IN (Type II and III), OB (Type II and III), DO (Type II and III), and AV (Type II and III). The significant 't' ratios for IN (Type II and III), DO (Type II and III) and AV (Type II and III) were 1.99, 2.32, 4.90, 3.50, 14.08, 17.25, 7.16 and 8.04. In case of OB (Type I) of the ELC teachers, significant mean differences were found with IN (Type II and III), DO (Type II and III), AV (Type III) and CO (Type II) conflicts. The 't' ratios were 7.57, 7.97, 9.27, 3.43, 3.32, and 6.43 for them, respectively. All these values are significant at .01 level. With regard to DO (Type I) of the ELC teachers, it is observed that the feeling of DO (Type I) was more in comparison to DO (Type II and III) and AV (Type III) because their mean differences are

TABLE 3  
*'t' Ratios between Organizational Conflict with Headmaster and Conflict with Senior and Subordinate Teachers as Expressed by ELC Teachers*

	Organizational Conflict (Type I) Headmaster				
	IN	OB	DO	AV	CO
<i>Organizational Conflict (Type II) Senior Teachers</i>					
Integrating	1.99*	7.57**	0.93	1.08	1.06
Obliging	4.90**	0.56	1.06	1.20	1.19
Dominating	14.08**	9.27**	2.15*	2.34*	2.34*
Avoiding	7.16**	1.77	0.83	0.93	0.93
Compromising	1.02	6.43**	0.56	0.64	0.64
<i>Organizational Conflict (Type III) Subordinate Teachers</i>					
Integrating	2.32**	7.97**	0.81	0.95	0.95
Obliging	3.50**	0.83	0.87	0.98	0.98
Dominating	17.25**	3.43**	3.16**	3.43**	3.40*
Avoiding	8.04**	3.32**	2.92**	3.29**	0.24
Compromising	0.81	0.28	0.23	0.26	0.26

\*  $p < .05$ 

df = 198

\*\*  $p < .01$ 

significant at .01 level. The ELC teachers have significant high values of AV (Type I) in comparison to DO (Type II and III) but it is just reverse in case of AV (Type III). In case of CO (Type I) the ELC teachers significantly differ with DO (Type II and III). The 't' ratios were 2.34 and 3.40 which are significant at .05 and .01 level for dominating organizational conflict Type I and II, respectively.

The next objective of the present study was inter-correlations as regards conflict with the headmaster and senior and subordinate teachers. This was done separately for the ILC and ELC teachers. The inter-correlations for the ILC and ELC teachers are presented in Table 4. The multiple correlations with variance percentage for the ILC and ELC teachers are presented in Tables 5 and 6.

From the observation of the correlation matrices it is clear that most of the variables of organizational conflict are significantly correlated. It is true for the teachers of both the personality types. The values given in Table 5 reveal that exchange of information and examination of differences of the ILC teachers to reach a solution acceptable to their headmaster can be predicted by CO (Type I), IN (Type II and III) and OB (Type II). How do the teachers with ILC personality characteristics neglect their own objective in a conflict situation to fulfil the objective of their headmaster? It can be predicted on the basis of CO

TABLE 4  
Inter-correlations between Organizational Conflict with Headmaster and Senior and Subordinate Teachers Perceived by ELC  
and ELC Teachers

ELC TEACHERS											
OCI-I						OCI-II					
IN	OB	DO	AV	CO	IN	OB	DO	AV	CO	IN	OB
<i>Organizational Conflict I (Headmaster)</i>											
Integrating	.393**	.066	.196	.636**	.446**	.132	.054	.004	.159	.333**	.223*
Obliging	.261**	.436**	.392**	.409**	.333**	.566**	.378**	.425**	.372**	.313**	.448**
Dominating	.003	.238**	.382**	.143	.225*	.499**	.692**	.387**	.321**	.119	.492**
Avoiding	.058	.451**	.523**	.169	.231*	.381**	.327**	.452**	.184	.179	.401**
Compromising	.390**	.368**	.007	.265**	.433**	.141	.157	.106	.293**	.453**	.318**
<i>Organizational Conflict II (Senior Teachers)</i>											
Integrating	.507**	.204**	.108	.384**	.435**	.051	.051	.195	.598**	.533**	.347**
Obliging	.047	.569**	.224*	.330**	.371**	.364**	.368**	.368**	.513**	.237**	.602**
Dominating	.192	.138	.621**	.008	.135	.248**	.521**	.177	.177	.154	.409**
Avoiding	.034	.358**	.484**	.141	.099	.381**	.493**	.225*	.225*	.188	.415**
Compromising	.446**	.369**	.035	.537**	.493**	.485**	.102	.325**	.325**	.515**	.498**
<i>Organizational Conflict III (Subordinate Teachers)</i>											
Integrating	.405**	.179	.071	.394**	.589**	.365**	.041	.226*	.600**	.527**	.527**
Obliging	.081	.528**	.288**	.321**	.174	.613**	.393**	.517**	.440**	.317**	.456**
Dominating	.237*	.238*	.660**	.004	.177	.245*	.803**	.450**	.030	.091	.454**
Avoiding	.040	.161	.446**	.504**	.151	.256**	.502**	.626**	.249*	.306**	.463**
Compromising	.243*	.180	.127	.188	.325**	.403**	.256*	.298**	.400**	.512**	.498**

\*P<.05 \*\*P<.01 df = 198

TABLE 5  
R Values and R<sup>2</sup> Values of ILCT Teachers on Organizational Conflict Scores

		IN	OB	DO	AV	CO
OCI-I	IN		.393 (15.44)	.066 (0.44)	.196 (3.84)	.636 (40.45)
	OB	.393 (14.44)		.330 (10.89)	.387 (14.98)	.688 (47.33)
	DO	.271 (7.34)	.436 (19.00)		.518 (26.83)	.635 (40.32)
	AV	.348 (12.11)	.394 (15.51)	.382 (14.59)		.614 (37.70)
	CO	.530 (28.09)	.472 (22.28)	.285 (8.13)	.169 (2.86)	
OCI-II	IN	.608 (36.97)	.489 (23.91)	.302 (9.12)	.209 (4.37)	.433 (18.75)
	OB	.462 (21.34)	.545 (29.72)	.393 (15.47)	.304 (9.24)	.234 (5.48)
	DO	.417 (17.39)	.558 (31.16)	.514 (26.42)	.362 (13.10)	.295 (8.70)
	AV	.368 (13.54)	.574 (32.98)	.530 (28.06)	.422 (17.81)	.271 (7.34)
	CO	.359 (12.89)	.580 (33.67)	.530 (20.14)	.405 (16.40)	.300 (9.00)
OCI-III	IN	.453 (20.52)	.579 (33.63)	.498 (24.77)	.391 (15.29)	.359 (12.89)
	OB	.373 (13.91)	.585 (34.19)	.516 (26.63)	.410 (16.81)	.368 (13.54)
	DO	.357 (12.74)	.591 (34.87)	.439 (19.30)	.410 (16.81)	.357 (12.74)
	AV	.339 (11.49)	.579 (33.40)	.587 (34.41)	.431 (18.58)	.342 (11.70)
	CO	.359 (12.89)	.576 (33.23)	.569 (32.39)	.179 (3.20)	.353 (12.40)

R<sup>2</sup> values are given in parentheses.

(Type I), IN (Type II and III), OB (Type II and III), DO (Type II and III), AV (Type II and III) and CO (Type II and III) because these components contribute a good amount to obliging organizational conflict. DO (Type II), AV

(Type II and III), CO (Type II and III) and IN (Type III) separately contribute above 20 per cent to the ELC teachers' feeling to win their position. In case of the teachers' negligence of their own concern to satisfy the concern of the headmaster, it can be predicted on the basis of DO (Type II and III), AV (Type II and III), CO (Type II and III), IN (Type III) and OB (Type III) because these conflicts separately contribute above 20 per cent. Only DO (Type I) contributes above 20 per cent to the ELC teachers' sidestepping behaviour in a conflicting situation. The ELC teachers' behaviour which is responsible for sharing whereby both (the teacher and the Headmaster) give up something to solve conflict can be predicted on the basis of Type I IN, OB, DO, and AV conflict styles.

The values presented in Table 6 reveal that the exchange of information and examination of differences of the ELC teachers with their headmaster can be predicted by Integrating (Type I) and Compromising (Type I). The ELC teachers' characteristics to neglect their own objective in a conflicting situation to fulfil the objective of their headmaster can be predicted by Integrating (Type II and III), Obliging (Type II and III), Dominating (Type II and III), Avoiding (Type I, II and III) and Compromising (Type I, II and III) because these components contribute a good deal to organizational conflict. The ELC teachers'

TABLE 6  
R Values and R<sup>2</sup> Values of ELC Teachers on Organizational Conflict Scores

	IN	OB	DO	AV	CO
<i>Organizational Conflict I (Headmaster)</i>					
Integrating		.261 (6.81)	.083 (0.69)	.058 (0.34)	.590 (34.81)
Obliging	.261 (6.81)		.234 (5.48)	.321 (10.30)	.603 (36.36)
Dominating	.214 (4.57)	.373 (13.91)		.502 (25.20)	.467 (21.81)
Avoiding	.171 (2.92)	.481 (23.14)	.422 (17.81)		.454 (20.61)
Compromising	.355 (12.60)	.514 (26.42)	.321 (10.30)	.485 (23.52)	
<i>Organizational Conflict II (Senior Teachers)</i>					
Integrating	.469 (22.0)	.495 (24.30)	.271 (7.34)	.437 (19.10)	.511 (26.11)
Obliging	.398 (15.84)	.574 (32.95)	.285 (8.12)	.485 (23.52)	.514 (26.42)
Dominating	.399 (15.92)	.539 (29.05)	.404 (16.32)	.497 (24.70)	.453 (20.52)
confid.					

# PERCEIVED ORGANIZATIONAL CONFLICT

	IN	OB	DO	AV	CO
Avoiding	.437 (19.10)	.547 (29.92)	.458 (20.98)	.552 (30.47)	.425 (18.06)
Compromising	.464 (21.53)	.553 (30.58)	.409 (16.73)	.530 (28.09)	.478 (22.85)
<i>Organizational Conflict III (Subordinate Teachers)</i>					
Integrating	.437 (19.10)	.530 (28.09)	.382 (14.59)	.497 (24.70)	.501 (25.10)
Obliging	.428 (18.32)	.557 (31.02)	.387 (14.98)	.507 (25.70)	.500 (25.0)
Dominating	.400 (16.00)	.546 (29.81)	.450 (20.25)	.520 (27.04)	.459 (21.07)
Avoiding	.368 (13.54)	.523 (27.35)	.474 (22.47)	.545 (29.70)	.442 (19.54)
Compromising	.373 (13.91)	.500 (25.00)	.456 (20.79)	.531 (28.20)	.452 (20.43)

R<sup>2</sup> values are given in parentheses.

feeling to win others' position gets a good amount of support from Dominating (Type III), Avoiding (Type II and III), and Compromising (Type III). Integrating (Type III), Obliging (Type II and III), Dominating (Type I, II and III), Avoiding (Type II and III) and Compromising (Type I, II and III) separately contribute above 20 per cent to the ELC teachers' tendency to neglect their own concern to satisfy the concern of the headmaster. In case of the ELC, compromising tendency in a conflicting situation can be predicted on the basis of Integrating (Type I, II and III), Obliging (Type I, II and III), Dominating (Type I, II and III), Avoiding (Type I) and Compromising (Type II and III).

## DISCUSSION

The teachers with ILC characteristics greatly exchanged information and examination of differences to reach a solution acceptable to the headmaster, in comparison to neglecting their own objective, ignorance of senior and subordinates' concern. The ILC teachers exhibit a significantly more amount of negligence of their own concern to satisfy the concern of the headmaster, in comparison to the needs of the senior and subordinate teachers. When the ILC teachers are having their own interest, then they go to any extent to fulfil their own objective. They are very prompt to satisfy their own needs as well as the requirements of their senior and subordinate teachers. Generally, they solve

their conflict by exchanging information and examination of differences with their seniors and subordinates and seeking a middle ground position.

The teachers with ELC personality characteristics differently perceive the problems and try to solve them in a different manner. They try to solve their conflicts and differences by exchanging information and examination of differences with their senior and subordinate. They avoid to solve the conflict with the help of the headmaster. They fail to satisfy their own concern as well as the concern of their senior and subordinate colleagues. The ignorance of the needs and expectations of the senior and subordinate teachers was found significantly low in the ELC teachers, in comparison to neglecting their own concern to satisfy the concern of the headmaster and seeking a middle ground position in a conflicting situation.

A close scrutiny of the above findings makes it clear that the teachers with different personality make-up interact differently in problematic situation to resolve their conflicts with the headmaster. The ILC teachers prefer to satisfy the aims of their headmaster rather than exchange of information and examination of differences with their senior teachers to reach a solution. It is just opposite in case of the ELC teachers. Here it is also found that the ILC teachers sometimes are unable to satisfy their own concern as well as the concern of the headmaster and they often ignore the needs and expectations of their subordinates, which is not so in case of the ELC teachers. These results are in line with the conceptualisation of Rahim and his associates on organizational behaviour and management.

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## Motivational Differences Among High and Low Creative Students

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**A**N understanding of the dynamics of motivation is a prerequisite to the understanding of human behaviour. This is a hypothetical construct postulated by psychologists to explain the human behaviour. Though a number of theories of motivation have been pronounced by various psychologists, need theories of motivation still continue to dominate the scene. Murray (1938) was the first psychologist to explain the concept of need. He viewed needs as forces that influence one's perceptions and behaviour in an attempt to change the unsatisfying situation. The concept of human needs is also central to Maslow's (1954) theory of motivation. He maintains that unsatisfied human need creates tension within the organism and serves as a force to direct the behaviour towards goals that individual perceives as rewarding, in other words, goals that reduce tension.

Creative students have been studied by a number of researchers till now and it has been well established that mere level of intellectual ability usually expressed in terms of IQ is not the key factor which distinguishes the high creatives from the low creatives.

Though researchers like Hudson (1966) and Cropley (1966) maintain that the student with high creativity ability possesses a characteristic intellectual style. Creative performance, according to them, does not depend only on certain cognitive characteristics and functions. Vinacke (1952) also asserts that these cognitive characteristics are essential to creativity but they do not function in isolation but rather in relation to a total personality system of needs, attitudes, motivation, values, goals, emotions and level of aspiration.

Several psychologists have emphasized that there exists a close relationship between creativity and motivation. For instance, Maslow (1959) has spoken most forcefully on this theme. He equated creativity with the state of psychological health and thus with the self-actualization process. He says that creativity is a universal characteristic of self-actualizing people. Carl Rogers (1961) also considered 'psychological safety' and 'psychological freedom' necessary for the development of creativity in the individuals.

Guilford (1980) states that creative people are reported to be highly motivated, and show a high energy level, with effective work habits. He further mentions some specific motives which, he thinks, are related to creativity. Such motives are an unusual strong curiosity, a need for adventure, willingness to take risks, tolerance for ambiguity, strong need for autonomy and self-direction, need for recognition from others for his accomplishments, high level of self-sufficiency and self-assertion.

#### REVIEW OF STUDIES: INDIAN SCENE

Only few studies have been conducted on the psychological needs or motivational aspect of creative students. These have been reported as under:

The first study of this nature seems to have been conducted by Raina (1968). He studied some correlates of creativity in Indian students. The results revealed that (i) high creative subjects exhibited greater n-achievement, n-autonomy, n-dominance, n-change and n-endurance than low creative subjects, (ii) the high creative females were significantly higher than the low creative females on n-achievement, n-autonomy, n-dominance, n-change and n-endurance but latter were characterized by n-deference, n-order, n-affiliation, n-succorance and n-hetosexuality. The high creative males showed greater n-achievement, n-autonomy, n-dominance, n-change, n-endurance, and n-aggression than the low creative students, (iii) the high creative females were higher on n-change

and n-endurance but the latter were higher on n-hetrosexuality, (iv) the low creative females scored significantly higher than the low creative males on n-achievement, n-dominance, n-change and n-endurance.

Gopal, Sharma and Singh (1980) probed into the motivational differences among high and low creative university students. The findings revealed that the two groups showed highly significant differences with regard to aggression motive and security motive. However, no such differences could be observed for the other three motives, namely achievement motive, affiliation motive and power motive.

Ramjee Lal (1984) reported that the low creative group possessed a significantly higher need deference than the high creative group but possessed higher level of n-abasement in comparison with the high creative group. Further, the high and low creative groups differed significantly with regard to n-autonomy and n-aggression. It was also found that the low creative group had greater need for nurturance, than the high creative group. The high creative group yielded significantly high mean scores for 'n-succorance.'

Vasesi (1985) found that on the measures of needs, the high creatives were significantly high on n-achievement, n-autonomy, n-interception, n-dominance, n-nurturance, n-change, n-order, n-exhibition, n-affiliation, n-succorance and n-hetrosexuality. The differences on measures of n-abasement and n-aggression were non-significant.

Rani (1986) found that the high and low creative subjects were not significantly differentiated on anxiety, need achievement and need dominance.

Srivastava (1988) conducted a study to determine whether high and low creative pupils differed significantly with respect to their fifteen personality needs. The results indicated that the high and low creatives differed significantly on ten personality needs. It was noticed that in case of high creative subjects n-achievement, n-exhibition, n-interception, n-succorance, n-nurturance and n-change were found to be significantly correlated with creativity. In case of low creative subjects, n-exhibition and n-aggression were identified to be positively and significantly correlated with creativity while n-nurturance was observed to be negatively and significantly correlated with creativity.

Pandey (1988) studied the motivational determinant of creativity. The role of achievement motivation and risk-taking in creativity was examined on a sample of school children. Inconsistent results were obtained in case of male and female groups. Achievement motivation failed to differentiate the high and low creatives in the male group and also in the female group. However, the risk-taking could differentiate high and low creatives but only in the male group.

The above cited research studies reveal the fact that high and low creative

students differ from each other on certain psychological needs or motivations. But in view of the dearth of systematic studies on the motivational aspect of creative students, there is considerable scope for conducting further research. The present study was undertaken to find out the motivational differences in terms of psychological needs among high and low creative students.

### OBJECTIVES

More specifically the following objectives were formulated for the present study:

1. To compare high and low creative students on ten psychological needs.
2. To compare high and low creative male students on ten psychological needs.
3. To compare high and low creative female students on ten psychological needs.
4. To compare high creative male and high creative female students on ten psychological needs.
5. To compare low creative male and low creative female students on ten psychological needs.

### HYPOTHESES

The following hypotheses were framed for testing:

1. High and low creative students will differ significantly with regard to their psychological needs.
2. High and low creative male students will differ significantly with respect to their psychological needs.
3. High and low creative female students will differ significantly with regard to their psychological needs.
4. High creative male and high creative female students will show significant differences on their psychological needs.
5. There will be significant differences in the psychological needs of low creative male and low creative female students.

### METHODOLOGY

#### *Sample*

One hundred male and 100 female students studying in Class XI of two senior secondary schools of Shimla city constituted the sample of the study.

Random sampling method was used to draw the sample and institutions as well.

### *Tools Used*

The following tools were used for data collection:

1. *Verbal Test of Creative Thinking*: Creativity of the students was measured through the Verbal Test of Creative Thinking developed by Dr Baquer Mehdi (1973). This test induces tasks pertaining to fluency, flexibility and originality. It consists of four subjects, namely, consequence test, unusual uses test, similarity test and product improvement test.

The test-retest reliability coefficients of correlation of factor scores and total scores were obtained as 0.945, 0.921, 0.896 and 0.959. The validity coefficients against the teacher ratings for each factor and total verbal creativity came out to be 0.40, 0.32, 0.34 and 0.39.

2. *Meenakshi Personality Inventory*: Ten psychological needs of the students were measured through the Meenakshi Personality Inventory developed by Meenakshi Bhatnagar (1974). This inventory has been designed to measure ten psychological needs as defined by H.A. Murray. These ten needs are (1) n-achievement, (2) n-exhibition, (3) n-autonomy, (4) n-succorance, (5) n-affiliation, (6) n-dominance, (7) n-abasement, (8) n-nurturance, (9) n-endurance, and (10) n-aggression. Each of the needs is measured through eight statements which the subject encircles and thus say that it is true about him. All items as picked up by subject yield a score which indicates the strength of that need. The whole inventory consists of 100 pairs of items arranged in a particular manner.

The reliability of the inventory was established by the split-half method. The reliability coefficients of needs scales were found ratings between 0.72 to 0.92. The validity was determined by taking the EPSS (Hindi Bhatnagar) as the criterion. It was found to be quite satisfactory.

### *Data Collection*

The data were collected by administering the above-mentioned two tools on the students included in the sample. Scoring was done following the procedures as laid down in the manuals. However, before administration of the tools, necessary instructions were given and the mode of recording the responses was explained to the students. Proper rapport was established with them. A break of ten minutes was observed between administration of the two tests.

*Groups Formation*

In order to identify high and low creative students, the raw scores of fluency, flexibility and originality of the four sub-tests were converted into T-scores following the procedure suggested by Dr Mehdi:

$$\frac{SD}{10} (X - M) + 50$$

Then the T-scores were added to give the composite scores of creativity for each student. The categorization of the students into high and low groups was done by computing  $Q_1$  and  $Q_3$  values of the distribution of creativity scores for male and female students separately.

## RESULTS AND DISCUSSION

In order to find out the significance of the mean difference in the scores of motivation of the high and low creative students, the means and standard deviations were calculated for the scores of each need. The obtained statistics are presented in Table 1.

TABLE 1 Significance of Difference between the Means of Scores Obtained by High and Low Creative Students on Different Psychological Needs						
Sl. No.	Needs	High Creative (N=48)		Low Creative (N=57)		't' Value
		Mean	SD	Mean	SD	
1.	n-Achievement	10.52	1.98	10.61	1.91	0.235 <sup>NS</sup>
2.	n-Exhibition	3.41	2.71	3.57	1.82	0.348 <sup>NS</sup>
3.	n-Autonomy	6.16	1.91	6.50	1.98	0.894 <sup>NS</sup>
4.	n-Affiliation	8.50	2.59	8.57	1.99	0.153 <sup>NS</sup>
5.	n-Success	5.41	1.83	5.35	1.85	0.107 <sup>NS</sup>
6.	n-Dominance	7.10	1.62	6.45	1.81	0.940 <sup>NS</sup>
7.	n-Abasement	9.58	1.83	9.66	1.60	0.236 <sup>NS</sup>
8.	n-Nurturance	12.35	1.72	12.01	1.60	0.944 <sup>NS</sup>
9.	n-Endurance	11.22	2.39	10.71	2.04	1.64 <sup>NS</sup>
10.	n-Aggression	2.79	1.47	3.24	1.91	1.364 <sup>NS</sup>

NS = Not Significant at .05 Level.

Table 1 shows that all the ten 't' values comparing the mean differences

of the high and low creative students on needs came out to be insignificant at .05 level of confidence. This implies that the high and low creative students did not differ significantly from each other with respect to their motivation. Hence the research hypothesis stating that high and low creative students will differ significantly with regard to their psychological needs was not confirmed.

The results of the present study are in contradiction to the findings of Raina (1968) who found that high creative students score significantly higher than low creative students with regard to n-achievement, n-autonomy, n-dominance, n-change, and n-endurance. Gopal, Sharma and Singh's (1980) study partially supports the findings of the study. They found that the two groups of creativity (high and low) show highly significant differences in respect of aggression and security motive but no significant differences with regard to achievement motivation and affiliation motivation.

The motivational differences between the high and low creative male students were found by calculating 't' values for ten psychological needs. The obtained statistics are given in Table 2.

Sl. No.	Needs	High Creative (N=48)		Low Creative (N=57)		't' Value
		Mean	SD	Mean	SD	
1.	n-Achievement	10.11	1.97	11.05	1.89	1.626 <sup>NS</sup>
2.	n-Exhibition	4.04	3.17	4.33	1.69	0.392 <sup>NS</sup>
3.	n-Autonomy	6.43	1.69	6.00	1.85	0.805 <sup>NS</sup>
4.	n-Affiliation	8.38	2.32	7.76	1.44	1.097 <sup>NS</sup>
5.	n-Succorance	5.50	1.84	5.09	1.38	0.854 <sup>NS</sup>
6.	n-Dominance	7.04	1.50	6.48	1.59	1.204 <sup>NS</sup>
7.	n-Abasement	9.0	1.59	9.71	1.72	1.423 <sup>NS</sup>
8.	n-Nurturance	12.65	1.41	12.48	1.59	0.374 <sup>NS</sup>
9.	n-Endurance	10.58	2.53	11.00	2.05	0.615 <sup>NS</sup>
10.	n-Aggression	2.92	1.54	3.09	1.74	0.343 <sup>NS</sup>

NS = Not Significant at .05 Level.

It is evident from Table 2 that in the male group, the high and low creative students did not show any marked difference in their psychological needs. It led to the conclusion that motivational differences did not exist between the high and low creative male students. Thus the research hypothesis that high



and low creative male students will differ significantly with respect to their psychological needs, could not be substantiated by the empirical data.

The investigation undertaken by Raina (1968) revealed that high creative male students had greater n-achievement, n-autonomy, n-dominance, n-endurance, n-change, and n-aggression than low creative male students, and low creative male students exhibited greater n-defence and n-hetrosexuality. These findings are not in line with the findings of the present study.

To make the comparison of the motivation of the high and low creative female students, ten 't' values were calculated. These values along with means and standard deviation are presented in Table 3.

Sl No.	Needs	High Creative Females (N=22)		Low Creative Females (N=36)		't' Value
		Mean	SD	Mean	SD	
1.	n-Achievement	11.00	1.91	10.36	1.84	1.219 <sup>NS</sup>
2.	n-Exhibition	2.68	1.79	3.13	1.75	0.918 <sup>NS</sup>
3.	n-Autonomy	5.86	2.12	6.80	1.99	1.643 <sup>NS</sup>
4.	n-Affiliation	8.64	2.87	9.05	2.11	0.569 <sup>NS</sup>
5.	n-Succorance	5.32	1.82	5.50	2.07	0.340 <sup>NS</sup>
6.	n-Dominance	7.18	1.73	6.44	1.93	1.474 <sup>NS</sup>
7.	n-Abasement	10.27	1.86	2.62	1.51	1.354 <sup>NS</sup>
8.	n-Nurturance	12.00	1.98	11.75	1.55	0.494 <sup>NS</sup>
9.	n-Endurance	22.00	1.35	10.55	2.03	0.996 <sup>NS</sup>
10.	n-Aggression	2.64	1.37	3.33	2.00	1.527 <sup>NS</sup>

NS= Not Significant at .05 Level.

Table 3 reveals that none of the 't' values came out to be significant even at .05 level of confidence. This means that there were no significant differences in the motivation of the high and low creative female students. Thus the research hypothesis anticipating significant differences between high and low creative female students with regard to psychological needs, was not supported by the data. The findings of the present study are in disagreement with those of Raina (1968) who found that high creative female students are characterized by higher level of n-achievement, n-autonomy, n-dominance, n-change, and n-endurance. Low creative female students appear to have significantly higher level of n-defence, n-order, n-affiliation, n-succorance and n-hetrosexuality.

The statistics calculated for finding out the differences in motivation of high creative male and high creative female students are given in Table 4.

Sl. No.	Needs	High Creative Males (N=26)		Low Creative Females		't' Value
		Mean	SD	Mean	SD	
1.	n-Achievement	10.11	1.97	11.00	1.91	0.105 <sup>NS</sup>
2.	n-Exhibition	4.04	3.17	2.68	1.79	1.826 <sup>NS</sup>
3.	n-Autonomy	6.43	1.69	5.86	2.12	0.995 <sup>NS</sup>
4.	n-Affiliation	8.38	2.32	8.64	2.87	0.333 <sup>NS</sup>
5.	n-Succorance	5.50	1.84	5.32	1.82	0.390 <sup>NS</sup>
6.	n-Dominance	7.04	1.50	7.18	1.75	0.288 <sup>NS</sup>
7.	n-Abasement	9.00	1.59	10.27	1.86	2.461*
8.	n-Nurturance	12.65	1.41	12.00	1.98	1.260 <sup>NS</sup>
9.	n-Endurance	10.58	2.53	11.00	1.35	0.717 <sup>NS</sup>
10.	n-Aggression	2.92	1.54	2.64	1.37	0.651 <sup>NS</sup>

NS=Not Significant at .05 Level.

\*Significant at .05 Level.

It may be seen from Table 4 that out of ten 't' values, only one 't' value (2.461) came out to be significant at .05 level of significance. This points to the fact that the high creative male and high creative female students differed significantly on need abasement and the mean difference was in favour of the high creative female students. Thus the research hypothesis that high creative male and high creative female students will show significant differences in their psychological needs, was partially accepted.

Further, the significance of differences between the mean scores obtained by the low creative male and low creative female students on ten psychological needs/motivation were found out by 't' tests. The obtained statistics in this regard are given in Table 5.

Table 5 shows that the 't' values for the mean difference in n-achievement, n-autonomy, n-succorance, n-dominance, n-abasement, n-nurturance, n-endurance and n-aggression of the low creative male and low creative female students did not come out to be significant at .05 level of confidence. This means that the low creative male and low creative female students were equal

TABLE 5  
Significance of Difference Between Means of Scores Obtained by Low Creative Male and Low Creative Female Students on Different Psychological Needs

Sl. No.	Needs	High Creative Males (N=21)		Low Creative Females (N=36)		't' Value
		Mean	SD	Mean	SD	
1.	n-Achievement	11.05	1.89	10.36	1.89	1.285 <sup>NS</sup>
2.	n-Exhibition	4.33	1.69	3.13	1.75	2.500*
3.	n-Autonomy	6.00	1.85	6.80	1.99	1.500 <sup>NS</sup>
4.	n-Affiliation	7.76	1.44	9.05	2.11	2.682**
5.	n-Succorance	5.09	1.38	5.50	2.07	0.880 <sup>NS</sup>
6.	n-Dominance	6.48	1.59	6.44	1.93	0.083 <sup>NS</sup>
7.	n-Abasement	9.71	1.72	9.62	1.51	0.194 <sup>NS</sup>
8.	n-Nurturance	12.48	1.59	11.75	1.55	1.730 <sup>NS</sup>
9.	n-Endurance	11.00	2.05	10.55	2.30	0.787 <sup>NS</sup>
10.	n-Aggression	3.09	1.74	3.33	2.00	0.466 <sup>NS</sup>

NS = Not Significant at .05 level

\* = Significant at .05 level

\*\* = Significant at .01 level

on the above referred psychological needs. But it may be gleaned from the table that the low creative male and low creative female students differed significantly with regard to their n-exhibition, and n-affiliation. A perusal of the means of the low creative male and low creative female students on n-exhibition indicates that the low creative male students had significantly stronger need for exhibition than the low creative female students whereas the means of n-affiliation indicate that the low creative female students had significantly higher level of n-affiliation as compared to the low creative male students. Thus the research hypothesis that there will be significant differences in the psychological needs of low creative male and low creative female students was partially accepted. The findings of the present study with regard to achievement motivation and dominance and in contradiction with the findings of Raina (1968) who reported that low creative female students score significantly higher than low creative male students on n-achievement and n-dominance, n-change and n-endurance.

## CONCLUSION

On the basis of the analysis and interpretation of the data, some conclusions were drawn which are as below:

1. High and low creative students do not seem to differ significantly with regard to their psychological needs (n-achievement, n-exhibition, n-autonomy, n-affiliation, n-succorance, n-dominance, n-abasement, n-nurturance, n-endurance, and n-aggression) as measured by the Meenakshi Personality Inventory.
2. High and low creative male students do not tend to exhibit any significant differences which regard to their psychological needs as measured by the Meenakshi Personality Inventory.
3. There are no significant differences between high creative and low creative female students with respect to ten psychological needs as measured by the Meenakshi Personality Inventory.
4. High creative male students and high creative female students differ significantly only in case of n-abasement, the mean difference being in favour of high creative female students.
5. Low creative male and low creative female students differ significantly on n-exhibition and n-affiliation. Low creative male students have significantly stronger need for exhibition than low creative female students, whereas low creative female students have significantly higher level of n-affiliation as compared to low creative male students.

## CAVEATS

Three caveats are necessary in interpreting the results of the present study. First, only 100 male and 100 female students were used in the study; a larger sample would have been desirable. Second, verbal measure of psychological needs was employed to measure the motivation of the creative groups; projective tests of motivation could be used for having more valid results. Finally, verbal test of creativity was used in the present study to identify high and low creative students; verbal and non-verbal tests of creativity would have been desirable. Thus, there is a need for a further study to investigate the motivational differences between high and low creative students on the recommended line.

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## Ph.D. Theses Abstracts

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### *Educational Philosophy of J. Krishnamurti and its Implications for Modern System of Indian Education*

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**J** KRISHNAMURTI's educational philosophy is a direct outcome of his philosophy of life and he has given a practical shape to his educational philosophy in his schools in India, England and the USA.

The present study is an attempt to make a comprehensive and systematic investigation in all aspects of J. Krishnamurti's educational philosophy.

#### OBJECTIVES OF THE STUDY

The objectives of the study were to make an analytical study of the

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Punjab University (1989).

educational philosophy of J. Krishnamurti, to investigate its practical utility and relevance in the modern era, to compare the implications for education involved in the philosophy of J. Krishnamurti and the thoughts of other prominent modern Indian thinkers, to present a theoretical model for Indian education based on the educational philosophy of J. Krishnamurti and to suggest measures for integrating his educational philosophy in the Indian educational system.

#### TOOLS OF THE RESEARCH

Content analysis was used in this study both as a tool and a technique to analyse the educational ideas of J. Krishnamurti.

#### FINDINGS OF THE STUDY

J. Krishnamurti has contributed significant ideas relating to education.

He has a totally new and fresh outlook on education as he was an original thinker who 'departed completely from the beaten track to search in regions yet unexplored.'

Education for J. Krishnamurti means understanding of life and the self, to see the significance of life as a whole. He is against 'conventional education' which only helps the individual to fit in society as a cog in the wheel by encouraging imitation and authority. It smothers the spirit of inquiry in the individual and makes him pursue certain aims thereby setting the mind in a groove. Thus the total intelligence of the individual is not actively working as the individual is busy pursuing the set aims, mechanically.

Education, according to J. Krishnamurti, should help the individual to see life as 'it is' in the 'present moment', with total attention and a 'choiceless awareness of reality'. This is the only door to understanding of the self and life as a whole as life is a continuously self-renewing process and only such a mind that can renew itself from moment to moment can understand life, for only then he is one with life.

In order to create such a mind, education should be given in a way as to ignite the spirit of inquiry in the individual regarding his 'own self', 'life' and the 'total universe'. The educator must encourage the pupil to go deep into the question as to why he is being educated.

When Krishnaji talks about 'right education' it is not a matter of opinion or evaluation but it denotes 'total action' in which all self-interested motives cease. He argues for 'holistic approach' to education instead of the conventional education that is basically fragmented as it caters for only providing knowledge and skills and neglects other aspects like helping the individual to experience the integrated process of life.

Krishnaji identifies two vital movements in one's life. One is the movement of knowledge—technology, computers and information of the physical world. The other is the psychological movement of individual's conflicts, opinions, dogmas, beliefs, fears and sorrows. Krishnaji wants the teacher to help his student to seek for harmony in these two movements in one's life as he feels that to bring harmony between 'knowledge and intelligence' is the main function of education. By intelligence he means capacity for direct understanding which depends upon the sensitivity, alertness and awareness of the individual. The individual should know when to rely on knowledge and when to drop all knowledge and information and be one with the universe.

In order to be one with the universe the individual should be educated to read the book of the 'self' along with books of external knowledge. When the individual goes deep into the intricate working of his own mind, i.e. pursuing his own mind and thoughts, he realises that there is no 'self'. He then sees the false existence of the 'self' or 'ego' drops it and becomes a part of the universe. This is only possible when the individual goes deep into his conditionings, for example, conditioning that is separating one as a Hindu from a Muslim or Christian. To read the book of 'self', i.e. when one can observe his own feelings and reactions then it is real learning. As Krishnaji says, "You are the world" and "in each one of us the whole of existence is gathered". When one learns about himself by himself, then he is not a second-hand human being. Out of that learning, wisdom comes. It requires enormous intelligence, sensitivity and understanding to be free. The function of education is to help one to be free from the self and then one can live a most beautiful, extraordinary and happy life.

There is a departure in Krishnamurti's teaching from the traditional approach to the relationship between the teacher and the taught. The Guru and the Shishya—the traditional approach is hierarchical, there is a teacher who knows and a student who does not know and has to be taught. In Krishnamurti's view "the teacher and the student function at the same level--communicating through questioning and counter-questioning till the depths of the problems are exposed and understanding is revealed, illuminating the minds of both". It is a state of fluidity, attentiveness and movement which is possible only when there is no motive behind that learning. Motive sets the brain in a pattern and makes thinking mechanical, but without motive there is no teacher or taught, only teaching and learning. It is only possible when the teacher has a passion, which is a flame of itself, then he can transmit information without making the mind mechanical, then the mind is in a state of constant learning. In school the relationship between the students and the teachers should be very cordial and informal and the students would have the freedom to ask any question from



anywhere. Freedom is a state of mind in which there is no fear of compulsion, no urge to be secure. It does not mean doing whatever one wishes but to be free is to be intelligent and this intelligence means to understand your own self and environment. It pertains to a mind that is not occupied—free observation is a movement of learning. The teacher who is free from all authority and domination should see that his students do not start depending upon him as an authority, for then the process of 'awakening of intelligence' will come to a halt. Though it is very comfortable and gratifying to follow a leader but this drags the brain into sloth and slumber.

There should be no fear in the minds of the students. For that matter no ambitions and hence no competitions should be encouraged in schools. The students should set their own pace of learning. There should be no rewards or punishments given to the students. If they have any problem of discipline, it should be amicably talked over between the teacher and the students. No prizes, rank marks or certificates should be given in schools so that the students do not work through extrinsic motivations but academic excellence should be achieved by them through motivating them intrinsically. The students should learn history, geography or science for the sake of knowledge and out of curiosity but not to gain more marks than the rest.

In order to achieve a harmonious development of the individual along with academic excellence, great emphasis should be given to a wide range of activities like art and craft, dance and music, dramatics and debates, sports, yoga, swimming, gardening, athletics, work experience in rural centres, dairy farms, and agricultural farms, etc. In this way physical, mental, intellectual, emotional and aesthetical development can take place in the students.

Unlike the conventional system of education where the teachers are giving precepts and instructions in accordance with some system or ideal, Krishnaji felt that since 'education is flowering in goodness and intelligence' the schools must cater for the right type of environment in which the 'awakening of the intelligence' of the pupil can take place. Just as a plant requires the right type of environment and care by the gardener to grow and flower, similarly the educator must look after and guide the child with love and care so that he can 'grow from within' and flower in love and intelligence. To study a child, the teacher should be alert, watchful and self aware which demands much more intelligence and affection than is required for making the child follow some ideal. J. Krishnamurti felt that activities like 'Asthachal' in schools, when the students sit quietly for some time in outside Nature, preferably at the time of sunset, for meditation, will help the child to see the outside nature and the inner workings of his mind 'unconditionally'.

The ultimate aim of education is to achieve a true 'religious mind'. A

religious mind, not in the conventional sense, but by a 'religious mind' Krishnaji means a mind that is completely alone. Such a mind has been through the falseness of dogmas, beliefs and divisions brought about by organised religions. Not being nationalistic and not being conditioned by its environment, the religious mind has no horizons, no limits. It is explosive, new, young and innocent. This innocent mind is extraordinarily pliable, subtle, and it has no anchor. It is only such a mind that can experience 'Truth'—that which is not measurable, such a mind is creative. This mind is free from the past and hence can come upon the timeless or eternal. This cannot be taught but has to be caught by the individual from the very environment of the school. Only a mind that is free from desires, conflicts and sorrows can be overflowing with love and goodness even in the most adverse circumstances. Such is the religious mind that also contains a scientific mind and only that mind can explode in the present, giving birth to a new culture and society based not on violence but on a deep understanding.

On making a comprehensive comparative study in the educational philosophy of J. Krishnamurti and that of the modern philosopher-cum-educationists like Rabindranath Tagore, Sri Aurobindo Ghosh, Vivekananda, Mahatma Gandhi and S. Radha Krishnan, we find that their educational philosophies are deeply influenced by the idealistic tones of ancient Indian tradition but Krishnaji's philosophy is totally free of any ancient or modern concept of education and is a result of his 'unconditional and choiceless awareness of reality' from moment to moment.

However, the ultimate aim of education for all of them, including J. Krishnamurti, is the spiritual realisation of the 'self and life'. They all advocate all-round development of an individual's personality and that the student should achieve 'self education' and 'self discipline' while the teacher should act only as a guide and a helper to create the right environment for the child to flower in love and goodness. All the thinkers have emphasized the importance of maintaining world peace and said that the teachers should realise that learning is a life-long process and thus they should continue to learn throughout life along with their students.

#### IMPLICATIONS

In our schools we give moral education at the level of intellect which is the realm of thought. It is not possible to transform the long-range memory of the subconscious of an individual mind by imparting value education for a few periods in a week in the classroom.

Moral education emphasises 'what should be' and totally avoids the

observance of 'what is'. Krishnaji says that only 'what is' is a fact and not 'what should be'.

The first thing which we must keep in mind about Krishnaji's teachings is that they must reach the students absolutely 'uncontaminated'. Krishnaji has also emphatically said at another place, "when you listen to me that understanding is your understanding and not mine." It is very true scientifically also, for whenever we perceive anything we colour it with the accumulation of our own mind and the reality is coloured. It is because the measured object can never be completely separated from the measuring subject. So it is very important that the teachings of Krishnaji reach the younger generation uncontaminated by the interpreters. So his books dealing with education have been compiled separately for different age-groups by the investigator.

Certain outstanding features of Krishnamurti's concept of school can be imbibed by our government and private schools. Healthy traditions like 'Asthachai' for the awakening of intelligence, working with hands, feeling of responsibility towards one's environment, enquiry into human values, cultivation of global outlook, learning without fear, friendly and cordial relationship between the teacher and the students, no examinations till at least Class VIII, no competition or comparison between students, no system of reward and punishment, no prizes, ranks, marks or certificates, should be taken up. Introduction of a wide range of activities already mentioned should be encouraged along with maintenance of academic excellence through intrinsic motivation and not through extrinsic rewards and punishments.



*Achievement Motivation, Self-concept, Personal Preferences,  
Students' Morale and Other Ecological Correlates in Relation  
to Intelligence, Socio-economic Status and Performance of  
Higher Secondary Tribal Students of Rajasthan*

(Dr) S.B.H. CHISIRY

**T**HE present study was designed with the following objectives:

1. To study the relationship between some students' variables such as sex, class, stream, age, caste, aspiration (expressed) and SES

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Rajasthan University (1989)

- factors—education, occupation and income (levels)—of the parents and performance in relation to other psychological factors such as achievement-motivation, self-concept, personality needs, students' morale, performance, intelligence of tribal students of Rajasthan.
2. To study the score of achievement-motivation, self-concept, students' morale, personality needs, intelligence level and performance of tribal students of Rajasthan.
  3. To study the inter-relationship among the various variables as achievement-motivation, self-concept, performance, personality needs (15), students' morale (16), and intelligence.
  4. To compare the n-Ach. level of the tribal students with the available figures of n-Ach. levels of other groups of students, such as urban and rural and non-tribal students of Rajasthan.
  5. To examine whether different ecological factors such as sex, class, stream, age, caste, aspiration of the students and SES factors have any significant effect on the prediction of different variables such as n-achievement, self-concept, personal preferences, or personality needs, students' morale and intelligence.
  6. To analyse the various principal factors responsible for the personality make-up of the tribal students through factor analysis technique.

#### HYPOTHESES

The variables like sex, class, stream, age (levels), caste, aspiration of students, SES levels (education, occupation and income) are positively associated, and show significant difference, with dependent variables such as achievement-motivation, self-concept, personal preferences, students' morale and intelligence. In this way null hypotheses (Ho) would be formulated, i.e.  $36 \times 9$  hypotheses would be examined, i.e. all the dependent variables would be examined in relation to various independent variables (in levels).

#### SAMPLE OF THE STUDY

The sample covered students of Classes IX to XI belonging to urban, semi-urban and mostly rural areas of Rajasthan for the sample survey. The age-range of the boys and girls was between 13 to 22+. Only the tribal students belonging to 23 educational institutions were taken up for the present study and other backward class and scheduled caste students were excluded. The students were selected randomly from the six districts of Rajasthan. The students belonging to Grasiyas, Sahriyas, Kathodias and Damor tribes were

excluded from the present investigation, i.e. the study was only confined to the students from the Bhil and Mina Tribes.

#### TOOLS AND TECHNIQUES

1. Achievement Motivation Test prepared and standardised by Prayag Mehta and used in Indian condition for school-going children, was employed.
2. For measuring the self-concept of the tribal students the Hindi adaptation of the Piers and Harris Self-concept Scale, standardised in Hindi by K.S. Narula, was used.
3. For measuring the students' morale, the Students' Morale Test with 16 dimensions prepared by Santosh Narula and K.S. Narula was used.
4. The Indian adoption of EPPS by R.P. Bhatnagar and standardised on Rajasthan population by K.S. Narula and others was used to measure 15 different personality needs.
5. Non-verbal Test of intelligence by Ravens, J.C. (1956) consisting of sets — A, B, C, D, and E was used to assess the intelligence level of the tribal students.
6. For measuring the SES of the tribal students' parents, the SES scale (GIO) modelled after B. Kuppaswamy was used and item analysis for three dimensions of SES—education, occupation and income—was done without using the scoring system for composite SES scores.
7. For performance of academic achievement, the percentage of annual marks obtained by the students in their previous classes was considered as it provides a uniform criterion for students belonging to different classes.

#### *Dependent Variables*

**n-Achievement:** The mean n-Achievement score for 1300 tribal higher secondary students was found to be 10.04 with SD of 6.69 (for six stories) and for one story the mean, n-Achievement score was found to be 1.67 which is quite low as compared to the other studies conducted in India, in general, and in Rajasthan, in particular.

This shows that the tribal higher secondary students of Rajasthan are having low motivational level as compared to the other urban and rural higher secondary students of Rajasthan. The n-Achievement mean score for the tribal girls was found to be 2.5 which is slightly higher than that of the boys.

Their low motivation is due to poor socio-psychological environment. As such they need proper orientation in fantasy writing, i.e. they are less creative

and less imaginative. This can be provided through stimulating environments.

*EPPS Measures:* The means of EPPS needs a range between 12.37 (n-Aggression) to 15.69 (n-Achievement). These means are the lowest and the highest in magnitude for different personality needs. The urban and tribal students differ as regards their dominant and recessive needs of personality. It is due to their socio-cultural environment.

*Students' Morale test:* The means of morale score was found to be 199.82 with SD of 32.73 and the range score was found to be from 85 to 264. The high morale of the students is dependent on the teacher-student inter-personal relation, confidence in headmaster and management committee, good academic achievement and learning facilities, satisfaction, goal direction, adequacy of communication, teaching-learning skills and ability of the teachers. The factors responsible for poor students' morale are: conditions related to studies, academic achievement, students' benefits, friendliness and cooperation among the class fellows, identification with the schools, opportunity for growth and advancement.

*Intelligence and Performance:* The mean intelligence score on Raven's Progressive Matrices was found to be 20.02 with SD of 7.19 with the range of 0 to 40. It means that the tribal students could have less non-verbal intelligence and they are not familiar with abstract thinking. Thus they need be given better opportunities in this area of intelligence so that they may become better engineers, scientists, doctors and planners.

*Self-concept:* The mean was found to be 47 with SD of 11.64 and the range score was 12 to 77, i.e. the tribal students have got poor self-concept and only a few of them have high self-concept. There is a good variation as regards self-concept.

#### *Effect of Nine Independent Variables on 36 Dependent Variables*

*Effect of Sex:* Boys and girls differ significantly as regards their mean achievement motivation scores. The means have been found to be 9.84 (for boys) and 15 (for girls) with SD of 6.63 and 6.53. Thus the tribal girls are more motivated for higher education than the tribal boys. The tribal boys have been found slightly better in intelligence than the tribal girls. They also differ significantly as regards their self-concept, as the boys' means of self-concept is higher than the girls. Similarly, they also differ significantly as regards their morale level. But they differ in performance as their means have been found out to be 44.91 and 45.06 with SD of 7.48 and 8.18, respectively. When studied in relation to EPPS dimensions, concluded that they have got significant difference in their personality needs such as: to do one's own best, to be successful, to accomplish something requiring skills and to accomplish something of great significance. When studied in relation to Morale Dimension, found that the

girls' means is higher than the boys.

*Effect of Different Classes :* The achievement motivation means increase as we go from lower to higher classes, i.e. for Class IX it is the lowest and for Class XI it is the highest. This increasing trend is due to their maturity of understanding. But the ITI students have got higher intelligence score and significant difference in the means has been found in different combinations of different classes. With regard to self-concept and different classes they show significant difference in the means of self-concept index. On the morale test, significant difference has been found. On the performance side the performance score index is the highest for Class IX and the lowest for ITI students. The mean achievement score for all the classes is below 50 per cent. On the EPPS needs, different students belonging to different classes do not differ significantly in their mean performance scores. Thus the students' morale level gets affected with the shift in different classes, specially for school climate.

*Effect of Streams:* Different students belonging to different streams show difference in achievement motivation means, i.e. 12.14 and 11.74 with SDs of 7.30 and 6.17, respectively, i.e. different students opting different streams differ significantly in their intelligence levels also. Similarly, they also differ significantly as regards their self-concept. Their morale index is also different in different streams. The highest mean performance score has been obtained by the Science students, which is below than 50 per cent of the performance scores, and the same is true for Agriculture students also. So they also differ significantly as regards the Morale dimensions.

*Effect of Different Age-groups:* Different age-groups have got different achievement motivation means and they differ significantly with age-groups 13-14 to 21-22. If the higher is the age, the higher would be the achievement motivation index also. With different levels of age-groups, the self-concept index shows an erratic trend with the increase of age. However, the morale of the students is not affected by the different age-groups of the students, i.e. age level is not a barrier as regards high/low morale of the students. The tribal students belonging to different age-groups show a significant difference in the means for different personality needs such as n-autonomy, n-affiliation, n-succorance, n-change and n-aggression. They also show a different attitude towards different morale categories.

*Effect of Caste:* The Mina and Bhil students differ significantly as regards achievement motivation and self-concept indices, while in the rest of the variables as intelligence, morale and performance, they do not show a significant difference in the means. Morale and performance more or less are similar. It is observed that the achievement motivation index, intelligence level, self-concept and performance means are slightly higher in case of the Bhil than that

of the Mina students.

*Effect of Aspirations:* The tribal students having three levels of aspirations differ significantly in their self-concept, intelligence, morale, performance and self-concept. The average aspirants have got higher self-concept index than the low and best aspirants. Similarly, the low aspirants have got high morale index than the best aspirants. The performance score is also high for the best aspirants and vice-versa.

*Effect of Father's SES:* The students belonging to parents with high, average and low education do not differ significantly as regards their achievement motivation index, intelligence level, self-concept index, morale index and performance score. Thus the educational levels of the parents of the tribal students have got nothing to contribute to their achievement motivation index.

*Effect of Three Levels of Father's Occupation:* The three levels of occupation of the parents of tribal students do not affect the achievement motivation index, intelligence level, self-concept index, morale and performance significantly. The students belonging to average occupational level of the parents have got slightly higher intelligence and self-concept levels, while the students belonging to high and low occupational categories of the parents have less and high achievement motivation index.

*Effect of SES Income Levels:* The three levels of occupation of the parents have not much effect on the achievement motivation, intelligence, self-concept, and morale of the students, but it has a significant effect on their performance. The average income group students have got high achievement motivation index, intelligence level, self-concept index and morale index as compared to high and low income group students. High and low income group students differ significantly in their performance scores also.

#### OVERVIEW OF THE FINDINGS

The tribal students exhibit different types of behaviour and these can only be interpreted in the light of different environments—urban, semi-urban, rural and environments related to the remotest and far-flung areas situated in the forests, desert lands and hillock and the same is true for different types of schools they are studying in. All these factors affect the learning behaviour of the children which predict their learning outcomes. So the study has revealed that achievement motivation, self-concept, personality pattern, intelligence levels and students' morale need to be strengthened for better learning outcomes. As environmental influence helps to a great extent, to acquire learning in a substantial way, the effects of environments cannot be ignored, especially at home and in schools situated near the tribal areas as they



predict the different types of classroom climates prevailing in Ashram schools, residential schools and other schools in general.

On the basis of the study conducted and the results arrived at, it is suggested that more socio-psychological studies may be conducted, taking in view the different problems and needs of each tribe so that constructive educational and vocational programmes may be taken up for the all-round development of tribal students. So in tribal areas new schools, educational centres and community development centres should be opened. Multi-entry system should be encouraged in schools so that students may study different courses as per their convenience or their requirements.

Further, efforts should be made to appoint such teachers who belong to tribal areas or come from different tribes. Even less qualified teachers or untrained teachers can be appointed so that tribal students may get continuous teaching in schools.



### *Reading Characteristics of the Sighted and Blind School Students*

(Dr) NANDITA BASU ROY NEH SEN

THERE are more than 13 million disabled persons in India, ten per cent of whom have more than one disability. As per the 1981 Census, the total number of visually handicapped persons was 3.4 million and they constituted roughly 12 per cent of the total population. As many as 80 per cent of the blind live in rural areas where there are no facilities for their development.

A number of studies have been conducted on reading comprehension, reading difficulties and rate of reading of sighted children. In the case of blind students such studies are very less. Keeping this in view, a study was undertaken to explore into the reading done by blind students and how it differed from sighted students.

### OBJECTIVES

The main objectives of the study were:

1. To study the speed of reading of the blind and sighted students.
2. To compare the speed of reading of the blind and sighted students.
3. To compare the difficulty levels of reading matter which the blind and sighted students can read with complete comprehension.
4. To compare the comprehension levels of the blind and sighted students
5. To study the errors made by the blind and sighted students while reading.
6. To study the fluency and clarity in reading of the blind and sighted students.

### HYPOTHESES

The following hypotheses were set up for testing:

1. (a) There is no significant difference in the speed of reading of the blind and sighted students of the same class.  
(b) As the grade increases the speed of reading also increases.
2. There is no difference in the difficulty level of the reading material in the case of blind and sighted students.
3. There is no difference in the comprehension levels of the blind and sighted students.
4. There is no difference in the errors made while the blind and sighted students read.
5. There is no significant difference in the fluency and clarity in reading of the blind and sighted students.

### DELIMITATION

Keeping in view the time, energy and resources at the disposal of the researcher the study was delimited to oral reading, completely blind students and school students.

### SAMPLE

A sample of 240 students studying in blind and sighted schools was taken

up for the study.

#### TOOLS

The following tools were used:

- (i) Personal Data Sheet.
- (ii) Cloze Test for measuring speed of reading, reading comprehension, difficulty level of reading and few characteristics of oral reading.

#### MAJOR FINDINGS

1. There is no significant difference in the speed of reading of the blind and sighted students of the same class. The F values, i.e. F for grades is 1.39 which is not significant, but the values for F interaction 7.49 and F for blind and sighted is 1285.8, which are significant at .01 level. Thus the null hypothesis is rejected.
2. There is no significant difference in the difficulty level of the reading material in the case of the blind and sighted students. The F values, i.e. F for grades is 3.539, F for interaction is 6.216, F for blind and sighted is 56.017. The F for grades is significant, and the other two values are significant at .01 level. This shows the null hypothesis is rejected.
3. There is no difference in the comprehension levels of the blind and sighted students. The F values, i.e. F for grade is 3.14, F for interaction is 9.11, F for blind and sighted is 64.67. The F for grade is significant, and the other two values are significant at .01 level. This shows the null hypothesis is rejected.
4. There is no difference in the errors made while the blind and sighted students read. F values for grade is 1.23, F for interaction is 5.83, F for blind and sighted is 1230.5. F value of 1.23 is significant and the other two values are significant. This shows the null hypothesis is rejected.
5. There is no significant difference in the fluency and clarity in reading of the blind and sighted students. The CR values range from 2 to 5.4, and are significant. This shows the null hypothesis is rejected.



*Impact of Investigatory Approach upon Student-teacher Appraisal and its Implications for Science Teachers' Training Programme*

DR (MRS) CHANDER KANTA MALIK

EXPERIENCES have revealed that the most effective way to impart scientific instruction and knowledge to the students is through investigatory teaching, which means the analysis of scientific inquiry. In teaching science, the process of inquiry is to be encouraged. It also seems desirable to identify investigatory approach strategies and to try them out in the classroom situations. Cognitive organisation is an important aspect of teacher behaviour. It is also an indicator of the success of an approach and the training programme. The present study designed to investigate the following questions:

1. Does the learning of the investigatory approach develop desirable teaching competencies among the science teachers?
2. Does a change follow in the cognitive appraisal by the use of this approach?

HYPOTHESES

1. There is no significant difference in the cognitive appraisal of student-teachers about the investigatory approach between the three groups of student-teachers after their exposure through modular structured reading material.
2. There is no significant improvement in student-teachers' cognitive appraisal after learning the investigatory approach through live demonstration.
3. There is no significant improvement in student-teachers' cognitive appraisal after learning the investigatory approach through simulated peer teaching.

4. There is no significant improvement in student-teachers' cognitive appraisal after learning the investigatory approach through implementation.
5. There is no significant difference in student-teachers' cognitive appraisal about the investigatory approach among those students who learnt the approach through structured reading material; live demonstration; peer teaching and implementation than their counterparts, who learnt the approach through modular structured reading material and implementation experience.
6. There is no significant difference in student-teachers' classroom functioning on observed performance among the three groups of student-teachers exposed to modular structure reading material, live demonstration, simulated peer teaching and implementation modes of presentation of the investigatory approach singly or conjointly.

#### METHODOLOGY

The design of the study was multiple independent variable levels, matched, randomised, between subject, experimental control group design. The study was conducted by using the following tools prepared by the investigator: (i) Modular structured reading material, (ii) Cognitive appraisal scale, and (iii) Observation schedule.

Two hundred science student-teachers, male and female, of the three colleges of education at Rohtak were involved in the theoretical acquisition of the concept of the 'investigatory approach'. For intensive study 54 science student-teachers of Gaur Brahman College of Education, Rohtak formed the sample. They were picked up by following a purposive random sampling procedure. The groups were matched on sex, academic qualifications and teaching experience.

#### FINDINGS

1. The reactions of the science-teachers about the investigatory approach strategies are favourable.
2. There is an identical cognitive orientation after learning through the modular structured reading material stage.
3. Learning of the investigatory approach through viewing live demonstrations results in the improvement of the cognitive appraisal about the approach.
4. Learning of the investigatory approach through peer teaching shows

significant improvement in the cognitive appraisal

5. The cognitive appraisal in each stage of learning differs in a substantial manner, reflecting the distinct stages of learning as differentiable from the continuum of thoughtless to the thoughtful modes of functioning.
6. The maximum gain in the cognitive appraisal is at the stage of learning the approach through viewing live demonstrations.
7. Implementation improves the cognitive appraisal but the change in the appraisal is not statistically significant.
8. The student-teachers who learn the investigatory approach through structured reading material have much lower gain by this treatment than those who learn the approach through modular structured reading material, viewing live demonstrations and peer teaching.
9. The effectiveness of the implementation strategy is dependent upon the initial learning experience.
10. Satisfactory learning through the training programme determines the workability of the investigatory approach at the implementation stage.
11. Classroom performance is dependent upon learning and implementational experience.
12. Theoretical acquisition of knowledge of the investigatory approach does not result in propositional (functional) knowledge of the approach.
13. The student-teachers thinking while learning the investigatory approach as inferred from their responses after the first, second and third stage of treatment were in terms of doubts and fears about the different dimensions of the investigatory approach strategies.
14. The student-teachers' thinking after learning through implementation experiences were in terms of suggestions for the effective



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## Research Notes

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### *Piagetian Concepts of Conservation, Seriation and Classification in Relation to Intelligence*

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**T**HE human child, for a long time, was presumed to be non-different from the adult; the little child was considered a miniature adult. He was dressed in adult clothes cut to suit his size. He was expected to think and behave like adults. It took a long time for this faulty conception of human development

to change. Jean Piaget has experimentally proved that adult forms of thought are distinct from those of children. His theory has tried to prove that there are qualitative differences between the intellectual structures of children and adults.

Though the child of today grows into the adult of tomorrow, his thought processes do not have a comparable continuity. Children's thought processes bear the stamp of discontinuous change and development. Piaget's division of intellectual development from child to adult into four relatively distinct periods or stages and the structures and capacities that characterise a given stage are operative in nature, and hence, guide the child's thinking in the stages that follow.

Jean Piaget developed a unique theory of knowledge (genetic epistemology) which is distinct from philosophically conceived forms of epistemology. It is speculative in conception but empirical in operation in the sense that though it is based on purely speculative ideas of Kant, but Piaget gave it a form of empirical testability. According to this theory, child's cognitive development is stage-dependent in contrast to the age-dependent development theory of Freud and the maturational theory of Gessel. It is stage-dependent in the sense that attainment of a higher stage of cognitive development depends both logically and empirically on a stage of development that precedes it. For example, the development of formal reasoning and hypothesizing (the formal operational stage) is logically, and, hence, empirically dependent upon development of concrete operations in the child. The latter stage is characterized by attainment of conservation of mass, weight, volume and the ability to seriate, to classify, etc. Further attainment of concepts and abilities occurs as a result of children's active participation in, and interaction with, the environment. The child attains conservations, etc. to the extent he interacts with, and manipulates, the physical and social environment in which the child happens to be.

Of the four stages of intellectual development (viz. sensorimotor, pre-operational, concrete operational and formal operational, the stage of concrete operations is the most crucial for a child to enable him to grow into a full man capable of using, what Freud had termed, the secondary process cognitions. (The secondary process cognition of man is the most characteristic of him as a homosapien, which, according to Aristotle, also distinguishes him uniquely from rest of animal life). This is, in other words, his ability to think rationally and to act purposefully.

Now, the question remains: How is it developed or gets facilitated via education of the child? In fact, it is in this context that Piagetian epistemology means most and seems pertinent from the point of view of child's education—education which, according to R.S. Peters (1982), is initiation into something that is worthwhile. Development of concrete operational stage of



intellectual development is one answer to this vital question concerning child's education.

In the development of logical thinking abilities (which form the basis of formal reasoning), Piaget's main thrust is on the development of conservation of various concepts like number, mass, weight, volume, etc. as well as the ability to seriate and to classify objects, situations or relations. But the question that concerns us most is, what kind of environmental input is required to facilitate the development of such abilities? This answer is obvious: child's interaction with the environment—both physical and social. But what makes him interact with the environment depends to a reasonable extent on something that he is innately endowed with, as well as something that he has acquired or learned in the process of being reared up—his intellectual capacity or ability, his dispositions, motivations and skills, for example. Out of these, intellectual ability (also, sometime called intelligence) constitutes the internal or genetic factor to stimulate child's interaction with his environment, and resultingly may help in the development of conservation and other related abilities. This innate ability of the child seems more basic than other factors that might be thought of to stimulate child's interaction with his environment. The present study, therefore, aimed at getting to know the extent to which this innate capacity called intelligence, is related with development of the ability to conserve to seriate and to classify given objects, situations or relations. The knowledge of the results of this study, while on one hand, could help teachers to guide their students, on the other, could help psychologists and educational theorists to comprehend this global and controversial concept called intelligence by looking into the relationship that it is found to hold with each of the cognitive abilities mentioned by Piaget and referred to here as above.

Many investigators in the field of cognitive development attempted to study the global capacity called intelligence in the context of Piagetian concepts. Synoptic view of a few of the more important studies are presented below:

Feigenbaum (1963) studied the task complexity and IQ as variables in Piaget's problem of conservation. The sample comprised 90 subjects of 4-7 years of age. The data indicated that children's grasp of conservation tended to vary with their IQ and with the nature of the concrete experimental operations.

Za'rour (1971) examined the effect of sex, religion, scholastic level, SES and mother's literacy on conservation of number. The study was conducted on 224 Lebanese children. He concluded that scholastic level was not significantly related to conservation.

Bat-Haee et al (1972) studied the relationship between Piaget's conservation of quantity tasks and three measures of intelligence. It was found that there was positive correlation between the three measures of intelligence and

conservation of quantity.

De Vries (1974) tried to find out the relation between Piagetian conservation tasks and IQ. One hundred and forty-three children were divided into three groups: high, middle and low IQ groups on the basis of their performance on intelligence tests. These subjects were administered a series of tasks including conservation tasks of number, mass, length and liquid. He concluded that Piagetian tasks do appear to measure a different intelligence and a different achievement than do psychometric tests.

Ayers et al (1974) studied the relationship among ability to conserve perceptual motor skills, reading readiness and IQ. Piagetian conservation tasks of number, liquid amount, solid amount, weight, length and area were individually administered. Significant correlations were found between the measures of Piagetian tasks and IQ.

Rao (1976) studied the development of conservation of length, mass, weight, number, area and volume with respect to intelligence. Children were administered Raven's Coloured Progressive Matrices. He found that children with higher level of ability performed better than those with lower level ability.

The studies conducted on Piagetian concepts vis-a-vis intelligence are thus not conclusive to hold how intelligence (or scholastic aptitude) facilitates conservation concepts. It is for this reason, therefore, that the investigators took up this study to understand empirically the relationship that holds good between these.

#### OBJECTIVES

The present study was undertaken with the following objectives in view:

1. To study the development of conservation of mass with respect to intelligence.
2. To study the development of conservation of weight with respect to intelligence.
3. To study the development of conservation of volume with respect to intelligence.
4. To study the development of the ability to seriate with respect to intelligence.
5. To study the development of the ability to classify with respect to

intelligence.

In order to carry out the study, the objectives were translated into corresponding hypotheses which are stated as below:

1. There is a positive relationship between the development of mass conservation and intelligence.
2. There is a positive relationship between the development of weight conservation and intelligence.
3. There is a positive relationship between the development of volume conservation and intelligence.
4. There is a positive relationship between the development of ability to seriate and intelligence.
5. There is a positive relationship between the ability to classify and intelligence.

#### PROCEDURE AND DESIGN

To carry out the study, a representative cluster sample consisting of 240 subjects was drawn from various schools (rural and urban, both) of Rohtak District. The sampled subjects were in the age-group of 7 to 12 years (i.e. they were in concrete operational stage of cognitive development). To have measures on 'intelligence', Raven's Coloured Progressive Matrices (RCPM) were used, whereas to assess the conservation of mass, weight and volume, and the abilities to seriate and to classify Piagetian type tasks were structured and used. For administering these tasks, procedures as suggested by Piaget and Inhelder in their studies were strictly followed. For example, to assess conservation of mass, two plasticine balls of equal masses were taken, shown to the students and they were asked to examine closely to see that these balls were having the same amount of matter. While they were seeing all this, one of the balls was transformed into another shape, and questions were asked to see if the subjects had developed the concept of equilibration in respect of mass conservation. Similarly, equilibration ability was judged in respect of the conservation of weight and volume by adopting procedures appropriate to such assessments. In the case of conservation of weight, two plasticine balls having the same weight were taken, and one of the balls was divided into the two small ones and relevant questions were asked. For conservation of volume, 24 cubes arranged into two blocks of  $2 \times 2 \times 3$  were taken. These cubes were re-arranged as  $1 \times 2 \times 6$

and the subjects were asked whether they occupy the same space or not. For observing the ability to seriate six dolls and six sticks of different sizes were taken. The subjects were asked to arrange the dolls and the sticks in such a manner that each doll could have a stick according to its height. In the same way, the ability to classify was observed by using some geometrical figures as triangles, quadrilaterals and pentagons and the subjects were asked to classify them. The ability to seriate and to classify were also observed on the basis of two or more properties existing simultaneously in the object. For example, for double seriation, 16 plastic strips of varying lengths and breadths were taken. One vertical line of four strips was arranged by the Investigators in their ascending order of length and another of horizontal line of four strips in increasing order of their breadth. The rest were left for the subjects to arrange. For observing double classification, the experiment was done on the similar lines.

To score for conservation abilities levels 0, 1 and 2 were created (0 indicated non-conservers, 1 indicated transitionals and 2, conservers). Those who could answer correctly and also explained the reasons thereof, were named conservers, those who could give correct answer but failed to give the logical explanation, were the transitionals; whereas those who could not give a correct answer were termed non-conservers. The experiments were repeated with the same subjects with different materials or designs for each of the logical thinking abilities. These cognitive abilities constituted the dependent variables whereas intelligence (scores on CPM) constituted the independent variable.

The data on intelligence were also classified into three levels—1 (low intelligence), 2 (average intelligence), and 3 (high intelligence). PCPM 75 formed level 3, PCPM between 25 and 75 constituted level 2 and PCPM less than 25 formed level 1.

#### ANALYSIS OF DATA AND RESULTS

The data were analysed in two ways: first, by computing frequencies/per cent frequencies of conservers, transitionals, and non-conservers by intelligence for each of the dependent variables and second, by computing chi-squares in respect of each of the dependent variables, i.e. logical thinking abilities by intelligence (It is because intelligence is continuous variable, whereas conservation, etc. were bifurcated as conservers, transitionals and non-conservers. The results pertaining to the first type of analysis in terms of frequency and per cent frequency for each of the logical thinking abilities by intelligence are presented below in Table 1 through 7.

TABLE 1 Frequency/Per Cent Frequency of Mass Conservation by Intelligence (Total)				
Sample Size - 240				
Mass Conservation	Levels of Intelligence			
	1	2	3	Total
0	49 (33.11)	2 (3.85)	0 (0.00)	51 (21.25)
1	16 (10.81)	8 (15.38)	0 (0.00)	24 (10.00)
2	83 (56.08)	42 (80.77)	40 (100.00)	165 (68.75)
Total	148	52	40	240

(Figures in parentheses denote %age Column-wise)

TABLE 2 Frequency/Per Cent Frequency of Weight Conservation by Intelligence (Total)				
Sample Size - 240				
Weight Conservation	Levels of Intelligence			
	1	2	3	Total
0	119 (80.41)	22 (42.31)	2 (5.00)	143 (59.58)
1	27 (18.24)	19 (36.54)	13 (32.50)	59 (24.58)
2	2 (1.35)	11 (21.15)	25 (62.50)	38 (15.83)
Total	148	52	40	240

(Figures in parentheses denote %age column-wise)

TABLE 3 Frequency/Per Cent Frequency of Volume Conservation by Intelligence (Total)				
Sample Size - 240				
Volume Conservation	Levels of Intelligence			
	1	2	3	Total
0	148 (100.00)	39 (75.00)	14 (35.00)	201 (83.75)
1	0 (0.00)	12 (23.08)	11 (27.50)	23 (9.58)
2	0 (0.00)	1 (1.92)	15 (37.50)	16 (6.67)
Total	148	52	40	240

(Figures in parentheses denote %age column-wise)

TABLE 4 Frequency/Per Cent Frequency of Simple Seriation by Intelligence (Total)				
Sample size - 240				
Simple Seriation Ability	Levels of Intelligence			
	1	2	3	Total
0	43 (29.05)	1 (1.92)	0 (0.00)	44 (18.33)
1	33 (22.30)	11 (21.15)	1 (2.50)	45 (18.75)
2	72 (48.65)	40 (76.92)	39 (97.50)	151 (62.92)
Total	148	52	40	240

(Figures in parentheses denote %age column-wise)

TABLE 5 Frequency/Per Cent Frequency of Double Seriation Ability by Intelligence (Total)				
Sample Size - 240				
Double Seriation Ability	Levels of Intelligence			
	1	2	3	Total
0	145 (97.97)	41 (78.85)	12 (30.00)	198 (82.50)
1	3 (2.03)	11 (21.15)	18 (45.00)	32 (13.33)
2	0 (0.00)	0 (0.00)	10 (25.00)	10 (4.17)
Total	148	52	40	240

(Figures in parentheses denote %age column-wise)

TABLE 6 Frequency/Per Cent Frequency of Simple Classification Ability by Intelligence (Total)				
Sample Size - 240				
Simple Classification Ability	Levels of Intelligence			
	1	2	3	Total
0	45 (30.41)	3 (5.77)	0 (0.00)	48 (20.00)
1	46 (31.08)	8 (15.38)	2 (5.00)	56 (23.33)
2	57 (38.51)	41 (78.85)	38 (95.00)	136 (56.67)
Total	148	52	40	240

(Figures in parentheses denote %age column-wise)

TABLE 7 Frequency/Per Cent Frequency of Double Classification Ability by Intelligence (Total)				
Sample Size - 240				
Double Classification Ability	Levels of Intelligence			Total
	1	2	3	
0	147 (99.32)	43 (82.69)	16 (40.00)	206 (85.83)
1	0 (0.00)	9 (17.31)	20 (50.00)	29 (12.08)
2	1 (0.68)	0 (0.00)	4 (10.00)	5 (2.00)
Total	148	52	40	240

(Figures in parentheses denote %age column-wise)

The results pertaining to the second type of analysis (in terms of chi-square for each of the logical thinking abilities by intelligence) are presented in Table 8 below:

TABLE 8 Chi-square (Total)			
Sample Size - 240			
	DF	Value	Probability
Mass by intelligence	4	41.540	0.0001
Weight by intelligence	4	115.389	0.0001
Volume by intelligence	4	122.618	0.0001
Simple seriation by intelligence	4	45.051	0.0001
Double seriation by intelligence	4	114.401	0.0001
Simple classification by intelligence	4	55.748	0.0001
Double classification by intelligence	4	94.162	0.0001



## INTERPRETATION AND DISCUSSION OF RESULTS

Hypothesis No. 1 states that there is a positive relationship between the development of mass conservation and intelligence. This implies that subjects who scored high on coloured progressive matrices are more likely to develop the ability of mass conservation. A look at Table 1 shows that of the total 40 candidates falling in the higher ability group, all the 40 were found to be conservers. Whereas, of the 148 subjects falling in the low ability group, only 83 could attain mass conservation, the chi-square value of the samples ( $N=240$ ) is 41.540 DF 4 significant at .0001 level of significance. Thus, hypothesis No 1 stands accepted.

Hypothesis No. 2 states that there is a positive relationship between the development of weight conservation and intelligence. A perusal of Table 2 shows that in the low ability group, only two subjects could attain weight conservation out of a total of 148, who fell into this level of intelligence. In the case of high ability group, 25 out of 40 (62.50 per cent) were weight conservers. The percentage of non-conservers in the low ability group is 80.41 whereas in the average ability group, it is 42.31 and in the high ability group, it is 5 only. This clearly indicates that the percentage of non-conservers decreases with increase in the ability level and the percentage of conservers increases with increase in the ability level. This is further confirmed by the chi-square values. In all these cases, the chi-squares are significant at .0001 levels. Thus, Hypothesis No. 2 is accepted and we can hold that intelligence is positively related to weight conservation and, hence, to logical thinking.

Hypothesis No. 3 states that there is a positive relationship between the development of volume conservation and intelligence. A look at Table 3 shows that 100 per cent of the cases in the low ability group were non-conservers of volume. Seventy-five per cent were non-conservers from the average ability group, whereas 35 per cent were non-conservers in the higher ability group. The percentage of conservers in the average ability group increased to 1.92 and the percentage of conservers of volume in the high ability group increased to 37.50. These results clearly indicate that there is a positive significant relationship between intelligence and conservation of volume. To confirm these findings, chi-square values were computed which are presented in Table 8. The table shows that chi-square values against this relationship are significant at .0001 level of significance. Hypothesis No. 3 of this study, therefore, stands accepted.

Hypothesis No. 4 states that there is a positive relationship between ability to seriate and intelligence. This ability was studied first as simple seriation ability and second, as double seriation ability. The results related to simple

seriation ability are presented in Table 4. A perusal of Table 4 makes it clear that 48.65 per cent belonging to the low ability group (level 1), 76.92 per cent of the average ability group (level 2) and 97.50 per cent of the cases belonging to the high ability group (level 3) successfully displayed the simple seriation ability. On the other hand, 29.05 per cent of level 1, 1.92 per cent of level 2, and 0.0 per cent of level 3 could not display the ability of simple seriation. It is easy to see that there is a systematic increase of successful manifestors of ability of simple seriation in relation to increasing levels of intelligence; the chi-square values are significant at .0001 level of significance.

Similarly, the results related to double seriation ability are presented in Table 5 which shows that only 25 per cent of level 3 could display the ability of double seriation. Other cases were either those who remained in the transitional stage or who could not display the ability at all. On the basis of these results, one can easily infer that double seriation ability is a very complex ability, yet, it can be said that it has a significant positive relationship to intelligence. These results are further confirmed by the application of chi-square test (Table 8), the chi-square value is significant at .0001 level of significance. So, hypothesis No. 4 is fully accepted both in regard to simple seriation and double seriation ability.

Hypothesis No. 5 states that there is a positive relationship between the ability to classify and intelligence. The results pertaining to this relationship are contained in Table 6 (simple classification) and Table 7 (double classification). A look at Table 6 shows that 38.51 per cent of the cases at level 1, 78.85 per cent of the cases at level 2, and 95 per cent of the cases at level 3 showed the ability of simple classification.

Like the seriation ability, the ability to classify has also been studied at two levels; simple classification ability and double classification ability. The results computed in regard to the double classification ability are presented in Table 7. This table shows that only one subject, out of 148 (0.68%) belonging to level 1 of intelligence, was the successful achiever of the ability of double classification; only four subjects out of 40 (10%) belonging to level 3 of intelligence could achieve this ability. These results show that the ability of double classification like that of double seriation is a very complex ability and probably starts manifesting later in adolescent period. But one thing seems to be certain that this ability has a close relationship with intelligence and systematically varies with variation in the level of intelligence. The chi-square values against both simple classification ability and double classification ability are significant, making it clear that the ability to classify changes with levels of intelligence. Hypothesis No. 5, therefore, stands accepted.

Thus, the results of the present investigation are well in tune with the

findings of Feigenbaum (1963) Bat-Hace et al (1972), Ayers et al (1974) and Rao (1976) who empirically found that children with higher level of ability performed better on conservation tasks than those with lower level ability. They are of the view that grasp of conservation tends to vary with IQ.

On the basis of the findings of the present investigation, we can safely hold that what we call intelligence can well be conceived of at least, in part, in terms of cognitive or logical thinking abilities of Piaget. And second, at least indirectly, we can hold that the development of intelligence occurs via the development of such cognitive abilities, which further depends upon child's interaction with his physical and social environment. Therefore, the present study has direct implications in the education of children. Children should never be considered as passive recipients of knowledge (as most of us in India think them to be) but as generators and transformers of knowledge.

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*Interactional Effect of Creativity and Intelligence on Emotional Stability, Personality Adjustment and Academic Achievement*

DR (MRS) R K ARORA

CREATIVITY is a splendoured and complex concept which involves something unique. Progress in varied dimensions like economic growth, technological development and psychological well-being of a nation rests basically upon the creative talent. Every creative act has brought a new dignity to man and man's new dignity has added to the growth of civilisation. It has rightly been said, "A few creative minds can make an enormous difference to civilisation" (Toynbee, 1965).

Creativity as a concept grew out of the fact that the concept of intelligence could not account for creative behaviour. Still for a pretty long time creativity was treated as a synonymous to intelligence. Later these two mental abilities were declared as quite separate from each other. Inspite of involving two distinct mental operations, these two abilities are found to be related to each other, no doubt the extent of their relationship varies from study to study. Since divergent factors are relatively independent of cognitive factors, the intercorrelation between tests of these two categories are also low. A great deal of research on creativity has been devoted to settle the controversy which basically would regard creativity measures as either independent or all inclusive of intelligence measures. A very high positive relationship between these two variables has been reported by Andrews (1930), Perry (1960), Geizels and Jackson (1962), Passi (1971), Mehdi (1973), Jarial and Sharma (1980), Qureshi (1980), etc. A positive but low relationship between these two variables was found by Guilford and Christensen (1956), Thorndike (1963), Wallach and Kogan (1965), Raina (1965), Mehdi (1977), Badrinath and Satyanarain (1979), Deshmukh (1979) and Kishore (1981). Contrary to these findings, Mackinon (1961), Mehdi (1978) and Muddu (1980) have reported a negative relationship between them. In some studies the investigators (Chassell, 1960; Yamamoto, 1961; Khire, 1971, Jarial and Sansanwal, 1979) could not observe any sort of relationship between these two abilities. Even it was observed that intelligence at its different levels has different trends of relationship with creativity. Geizels and Jackson (1962), Pankooe and Kogan (1968), Wallach and Wing (1969) and Gupta (1980) found substantial independence between measures of creativity

and intelligence. But it is irrational to conclude that these two variables are completely independent. However, it has widely been accepted that general intelligence is still the main essential ability in predicting creativity scores. The 'Threshold' theory advanced by Torrance (1965) and supported by others hypothesises that at some point around an IQ of 120 the achievement of children is likely to be determined by their creativity than by the amount by which the IQ exceeds 120. Hence nothing conclusive could be discerned.

Regarding developmental aspect it has been found that personality factors are crucial in the development of creativity. The roots of creativity do not seem to lie in convergent or divergent thinking, but rather in the personality and motivational aspects of character (Hudson, 1966). Roe and Terman (1954), Singh (1979) and Gupta (1981) have referred genius and creatives as better adjusted. The findings of Bloom (1963), Cattell (1963), Drevadhl (1964), Jhag (1979) too suggested that emotional stability and adaptations are higher among creatives and scientists than general population. But Bhattacharya (1956) found Indian women artists to be slightly emotional and having higher degree of sensitivity. Similarly, Mackinnon (1962) found mathematicians to be complicated, courageous and emotional. Individuals characterised as impulsive, unrestrained and unstable scored high on creativity test measures (Barron, 1953; Getzels and Jackson, 1962; Bowers, 1967 etc.). Here again inconclusive results have been reported.

Regarding the attitude of creatives towards school work and their level of academic performance, some work is also reported. Mayden (1959) found creatives to be superior in intelligence and interested in academic achievement. Similarly, Reidking and Wickwire (1959) found creative children to value intellectual attainment and showed desirable attitude towards school work. Acharyulu (1978), Menon (1980), Vijayalakshmi (1980), Zargar (1980), Gnanambal (1982) and Singh (1982) found positive correlation between creativity and achievement. On the other hand, Gupta (1981) found that students with poor and average achievement were more creative. But Edwards and Taylor (1965) found a high intelligence group to be superior to a high creativity group on both achievement test and grade point averages.

Thus regarding the relationship between creativity and intelligence and their interactional effect on emotional stability, personality adjustment and academic achievement, one finds inconclusive and contradictory results. Hence it raises a pertinent question—How far do different creativity—intelligence groups differ among themselves on the variables of Emotional Stability, Personality Adjustment and Academic Achievement so as to determine their interactional effect on them?

Thus anticipating the importance and the sparsity of the work done in

India in this area, the present study endeavoured to make an investigation into the interactional effect of creativity and intelligence on emotional stability, personality adjustment and academic achievement.

For the purpose of the present study the following hypotheses were formulated:

1. High creative/high intelligence group is more stable emotionally than the other creativity-intelligence groups.
2. High creative/high intelligence group is most superior in personality adjustment to other creativity-intelligence groups.
3. High creative/low intelligence group is poorest of other creative-intelligence groups in personality adjustment.
4. High creative/high intelligence group surpasses the other creativity-intelligence groups in academic performance.
5. Low creative/high intelligence group performs better in academic achievement than low creative/low intelligence group.

## METHOD

### *Sample*

The sample of the present study consisted of 200 adolescents studying in Class XII of the four institutions of Aligarh city. The subjects were chosen from two boys' and two girls' intermediate colleges by random sampling technique. The age-group of the boys and girls ranged from 15 to 18 years.

### *Tools and Techniques*

The following tools were administered on the sample:

1. Creativity Thinking Test designed by Kishore Girraj was used to measure the creative ability of the subjects. It included both verbal and non-verbal tests of creativity. It measures creativity in terms of fluency, flexibility and originality and has an acceptable degree of reliability and validity.
2. Mixed Type Group Test of Intelligence constructed by P.N. Mehrotra, was used to equate the groups on intelligence. It consists of both verbal and non-verbal tests of intelligence.
3. Emotional Maturity Scale (EMS) prepared by Yasvir Singh and Mahesh Bhargava was used to assess the emotional stability of the sample under five categories--Emotional Stability, Emotional Regression, Social Maladjustment, Personality Disintegration and Lack of Intelligence.
4. Adjustment Inventory constructed by Quadri Jamal was used to measure

the personality adjustment of the sample. This consists of series of questions describing possible emotions, attitudes of behaviour in different situations such as social, emotional, health, home and financial revealing personality.

5. The total marks of all the subjects secured in high school examination of Uttar Pradesh Board of Secondary Education were collected from the records of annual examination and were used as achievement scores.

To obtain a composite score on creativity and intelligence, verbal and non-verbal tests of creativity and intelligence were used. In creativity tests three types of scores, namely, fluency, flexibility and originality were obtained and the raw scores in each of these categories were converted into standard scores which were then added together to get the composite creativity score. Through the administration and scoring of the verbal and non-verbal test of creative thinking two main groups were identified—high creative group (Group A) and low creative group (Group B). Within these two groups, further sub-groups were set up based on the creativity index and the intelligence scores. Thus the subjects were classified into four sub-groups reflecting the interaction of both creativity and intelligence as:

- 1A High Creative/High Intelligence
- 2A High Creative/Low Intelligence
- 3B Low Creative/High Intelligence
- 4B Low Creative/Low Intelligence

The main study, the administration of EMS and personality adjustment inventories, their scoring analysis and interpretation were confined to these four groups. Similarly, the high school marks of the students of these groups were collected and analysed. The number of students based on the scores of creativity and intelligence emerged as under:

Groups	No. of Students
1A High Creative/ High Intelligence	20
2A High Creative/Low intelligence	15
3B Low Creative/High Intelligence	10
4B Low Creative/Low Intelligence	25

Thus the main study was confined to 70 subjects only.

## ANALYSIS

The data were subjected to subsequent analysis for testing the various

hypotheses by applying the statistical techniques like 't' test in order to determine the significance of difference among different creativity-intelligence groups on the variables of emotional stability, personality adjustment and academic achievement.

## RESULTS AND DISCUSSION

Different creativity-intelligence groups were compared on emotional stability. The results are summarised in Table 1.

TABLE 1 Mean Difference of Emotional Stability and its Testing for Significance Among Different Creativity-Intelligence Groups (Higher the score, lesser the I-MS)							
S. No	Groups	N	M	SD	df	t values	Inter- pretation
1.	High Creative/High Intelligence	20	70.45	13.96	33=1.2	1.95	p .01
2.	High Creative/Low Intelligence	15	100.13	22.1	28=1.3	1.41	NS
3.	Low Creative/High Intelligence	10	84.1	17.59	43=1.4	4.00	p .01
4.	Low Creative/Low Intelligence	25	98.2	21.49	23=2.3	1.87	NS
					38=2.4	30	NS
					33=1.4	1.77	NS

It has emerged clearly from the results presented in Table 1 that High Creative/High Intelligence group is significantly highest in emotional stability than the remaining three Creative/Intelligence groups. Though group 1A did not differ statistically from Group 3B but the trend definitely indicates towards that. Hence the first hypothesis establishing the superiority of Group 1A to Groups 2A, 3B and 4B, to a greater extent, has been accepted. The results obtained very much synchronize with the findings of Wallach and Kogan (1970) who reported that High Creative/High Intelligence children can exercise within themselves both control and freedom, and both adult-like and child-like behaviour. It means that being high creative they tend to be unrestrained, uninhibited and open but at the same time being high intelligent they have the ability to restrict and control their impulses, thus, at times, show restraint in their behaviour. This accounts for inconsistency in their behaviour. The opposite result obtained in the High Creative/Low Intelligence group further endorses it. This group is found to be least stable, out of all the four groups. The results confirm the findings of Getzel and Jackson (1962), Hudson (1966) and Bowers



(1967), etc. who reported that individuals characterised as impulsive, sociable, talkative, uninhibited and unrestrained score high on creativity test measures. Similarly, Bhattacharya (1956) and Ray-Chaudhary (1961, 1963) found Indian artists to be slightly more emotional with a high degree of sensitivity. Likewise, Mackinnon (1962) found mathematicians to be emotional, Tuft (1961) found actors to be emotional and excitable. Therefore, the restraining effect of intelligence on their behaviour is absent as their intellectual level is low.

Thus it may be interpreted that high creatives who do not possess equally high level of intelligence show less maturity and stability in their behaviour, being basically impulsive, open and expressive, and unrestrained by nature. On the other hand, high creatives endowed with high convergent abilities are well-armed in exercising restraint over their behavioural manifestations and, therefore, are not easily overwhelmed by emotions. Thus intelligence plays a significant role in containing emotions. On the other hand, high creatives, not equally matched with high intelligence, submit easily to emotional pressures.

TABLE 2 Mean Difference of Personality Adjustment and its Testing for Significance Among Different Creativity-Intelligence Groups (Higher the score, lesser the adjustment)						
Groups	N	M	SD	df	t-values	Inter- pretation
A1	20	14.95	7.68	33=1-2	3.95	p .01
A2	15	29.33	13.07	28=1-3	3.15	p .01
B3	10	23.6	4.87	43=1-4	2.80	p .01
B4	25	23.24	10.97	23=2-3	3.11	p .01
				38=2-4	1.54	NS
				33=3-4	.10	NS

From Table 2 it may safely be concluded that those possessing both high convergent and divergent abilities are by far the most accommodative persons among different creative-intelligence groups. Conversely, the Low Creative/High Intelligence group seems to be least adjusted. Thus the results obtained affirm the hypotheses 2 and 3. Hence High Creative/High Intelligence adolescents are the most adjusted, and High Creative but Low Intelligent are the poorest in adjustment. It means creative abilities up to a certain level of intelligence help in adjustment. But it is quite inconclusive due to much contradictions reported. Whereas Lytton (1971) referred convergers inhibited and maladjusted

and viewed divergers as uninhibited displaying virtues such as wholesomeness, good adjustment, etc., Kneller (1965) described creatives as independent, unconventional and less adjusted. These contradictory findings have found support in many empirical studies (Cattell, 1963; Barron, 1969; Walberg, 1969; Schaefer, 1970; Blatt, 1971 etc.). It shows many other factors in operation which need to be identified and properly controlled in order to infer correctly.

TABLE 3  
Mean Difference of Academic Achievement and Its Testing for Significance Among  
Different Creativity-Intelligence Groups

Groups	N	M	SD	df	t-values	Inter- pretation
A1	20	302.95	33.77	33=1-2	4.83	p.01
A2	15	251.00	26.02	28=1-3	2.91	p.01
B3	10	263.00	35.34	43=1-4	6.24	p.01
B4	25	241.92	30.28	23=2-3	.94	NS
				38=2-4	.94	NS
				33=3-4	1.32	NS

It is evident from Table 3 that intelligence plays a significant role in academic performance. All the high intelligence groups performed better than the low ones. Thus, it further endorses the much-acclaimed findings. On close scrutiny another interesting phenomenon unfolds that even high creatives perform well. Whereas High Creative/High Intelligent topped in academic performance, the second position is held by the Low Creatives/High Intelligence group, and the High Creative/Low Intelligence group occupies the third position. Groups 2A and 3B do not differ significantly, hence may be equated on academic achievement. It confirms the hypotheses 4 and 5. It means that high creatives perform equally well.

Mayden (1959) found creatives to be interested in achievement. Reidking and Wickwire (1959) reported creative children to value intellectual attainment highly and showed desirable attitude towards school work. It means that minimal intelligence is required to show good results but further proficiency is achieved through creative potentiality. Thus creative potentiality improves it rather than being impediment in school performance. In addition to that, it also helps in creating desirable attitude towards school work provided school climate does not thwart creative impulse.

## CONCLUSION

On the basis of the analysis and interpretation of the data, an overall picture of the interactional effect of creativity and intelligence on emotional stability, personality adjustment and academic achievement has been drawn. High Creative/High Intelligence group has an edge over all the remaining groups in these two traits and performance. It means both creativity and intelligence play a significant role in determining behaviour and performance and all these variables effectively be predicted on the basis of both intelligence and creativity measures. High Creative/Low Intelligence and Low Creative/High Intelligence groups are at par in academic performance whereas in emotional stability and personality adjustment Low Creative/High Intelligence group is definitely superior to High Creative/Low Intelligence group. It means intelligence plays an effective role in determining emotional stability and personality adjustment as compared to creativity. Creative potential is significantly related to intelligence. Thus high IQ is not a sufficient condition for high D.P. ability, it is almost a necessary condition (Guilford, 1967).

In short, both creativity and intelligence interact upon behaviour and performance. The extent of development of these traits depends, to a greater extent, on the degree of creative potentiality and intelligence possessed. Hence both creativity and intelligence are quite significant in determining emotional stability, adjustment and academic achievement.

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### *Identification and Remedy of Difficulties in Learning Fractions with Programmed Instructional Material*

(Mrs) KUSUM BHATTA

**O**WING to the traditional position of the '3Rs', i.e. Reading, Writing and Arithmetic at the elementary stage, a considerable proportion of the school time is allotted to Arithmetic. The time allotted to Arithmetic periods in the time-table during the day seems to be most favourable for concentrated work. It has also occupied a prominent place in the 'Scholarship Examinations' taken at the age of ten, or eleven to the extent of fifty per cent of the written examinations. A child learns the basics of calculations and computations of complex terms in its early life.

The aim of this study was to inculcate in children the habit of learning 'Fractions' on their own with the help of Programmed Instructional Material. This material helped the children to learn at their own pace—slow or fast. It, thus, reduced individual differences, which the teacher in a classroom might

not do so easily. It also made the children independent as they had to work on their own to solve the Arithmetic problems posed to them. The fear and anxiety of the children learning mathematics were amply reduced by the material, as it provided spaced review in order to guarantee high order of success.

The present study tested the effectiveness of the Programmed Instructional Material as a remedial teaching tool. A teacher faces many difficulties while teaching a class of forty to fifty students. A teacher cannot pay attention to each and every child in such a big class. The student also is not free to vary his/her own rate of learning. In traditional method of teaching, a student is threatened by the task as there is no proper provision for feedback in this method of teaching. Thus, we see there are many problems in the traditional method of classroom teaching. All these problems can be removed, to a greater extent, by the use of programmed instructions.

Our examination system is such that a student gets pass marks even if he/she has many learning difficulties/deficiencies. His/her deficiencies or learning difficulties remain unremoved in that particular class. He/she enters the next class with all these difficulties and deficiencies. In the next class more deficiencies may be added to the previous ones. In this way the difficulties and deficiencies may get accumulated over the years which are not identified and hence unremoved at any stage of their schooling. The present study provided a Book-Format Programme for such students

#### OBJECTIVES OF THE STUDY

The following were the objectives of the study:

1. To develop Programmed Instructional Material on Fractions for students of Class V.
2. To use Programmed Instructional Material as a remedial tool.
3. To test the effectiveness of Programmed Instructional Material in classroom teaching for the students of Class V.
4. To test the significance of difference between the Traditional Method of Teaching and Teaching through Programmed Instructional Material.

#### HYPOTHESIS

The following research hypothesis of the study was formulated and tested.

There is a significant difference in performance between the Traditional Classroom Teaching Method and Teaching through Programmed Instructional Material.

### THE PROCEDURE

A sample of fifty students was selected from two MCD Primary Schools of Karol Bagh, New Delhi (Twenty-five students from each school).

This study had the following four basic procedural features:

1. Pre-treatment procedure
2. Treatment proper procedure
3. Post-treatment procedure
4. Data analysis procedure

Some highlights of these procedures go thus:

The pre-treatment procedure covered the description of preliminaries, pre-treatment assessment with the help of Criterion Tests for selecting participants for Programmed Instructional Material and the method of assigning subjects to the Experimental Group and the No-treatment Control Group. It also included the number of Criterion Tests used as pre-test with their description of contents. Four Criterion Tests were administered to the students on four consecutive days.

The treatment procedure included the preparation of a programmed unit on 'fractions', stages of administration of Programmed Instructional Material, instructions given to the subjects and precautions taken before providing Programmed Instructional Material.

Preparing a programmed unit included the following steps:

1. Study of the syllabus
2. Review of aims and objectives of the topic
3. Defining the pre-requisite skills
4. Decision regarding the type of programming to be used
5. Writing the draft frames
6. First try-out and then revision
7. Criterion evaluation of draft frames
8. Classroom try-out

After one week of the final treatment session, the subjects in both the Experimental and Control Groups were re-administered the four criterion tests to obtain criterion measures on the efficacy of Programmed Instructional Material.

The data analysis procedure described the gestalt of the study. Pre-test was conducted on both the Experimental and Control Groups. The Experimental Group was given the treatment, i.e. provided with Programmed Instructional Material whereas the Control Group was left without any treatment. Then post-test was administered on both the groups. Their Gain-Scores were calculated on the post-test.

## RESULTS AND INTERPRETATION

The procedure employed in the analysis of the data is enumerated below:

1. The investigator found out whether or not there was a significant difference between the two groups, namely, the Experimental and the Control Group.
2. Means and Standard Deviations of the gain scores of the two groups on post-test were calculated.
3. The significance of difference between the gain scores on post-tests of the Experimental and Control Groups was tested.

The significance of difference between the Gain-Scores of the two groups was tested at .05 level and at .01 level by applying t-test.

Mean of the Experimental Group	= 36.16
Mean of the Control Group	= 41.68
Standard Deviation of the Experimental Group	= 14.976
Standard Deviation of the Control Group	= 13.841
Standard Error of difference between Means	= 4.162
Calculated Value of 't'	= 1.326
Degree of Freedom	= 48
Value of 't' at .05 level for 48 df	= 2.017
Value of 't' at .01 level for 48 df	= 2.696

The value of 't' = 1.326, calculated from the data is less than the tabulated value of 't' = 2.017. Therefore, it is inferred that there was no significant difference between the means of the two groups at .05 level.

Mean and standard deviation of the gain scores of the Experimental and Control Groups were calculated on the post-test. The gain scores were computed by subtracting the pre-test scores from the post-test scores of the students.

Mean of Gain Scores of the Experimental Group	= 28.92
Mean of Gain Scores of the Control Group	= 14.08
Standard Deviation of Gain Scores of the Experimental Group	= 8.55
Standard Deviation of Gain Scores of the Control Group	= 6.27
Standard Error of Difference between Means	= 2.12
Degree of Freedom	= 48
Calculated Value of 't'	= 6.99
From the table:	
Value of 't' at .05 level for 48 df	= 2.017
Value of 't' at .01 level for 48 df	= 2.696

The value of 't' calculated from the data is more than the tabulated values of 't', 2.017 and 2.96 at .05 and .01 levels, respectively. Thus it can be inferred that the difference between the gain scores of the Experimental and Control Groups are highly significant.

There was a significant difference on the performance of the students by teaching through the Traditional Method and Programmed Instructions. Hence the research hypothesis was retained.

#### FINDINGS

The chief findings of the study are as follows:

1. Teaching and learning through Programmed Instruction can definitely help the students and teachers.
2. From the interpretation of the data collected, it can be safely inferred that the students receiving Programmed Instructional Material did better in post-test as compared to the other group.
3. Programmed Instructional Material worked effectively as a remedial tool.
4. Programmed Instructional Material not only helps the students to learn better but also help the teacher to know how the students learn better.

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## *Differential Personality Profiles and Socio-economic Status of the Traditional and Distance Learners*

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**T**HE on-campus instructional programmes have not been made meaningful, useful and attractive. Consequently, the on-campus learning cultures have lost their attraction and holding power. There are so many drawbacks in our old traditional system of education which is unable to cope with the rapidly changing social needs, values, aspirations, expectations and increasing population. There is a specific social demand which pressurised our educational thinkers, planners and administrators to introduce the distance mode of education by Indian educational structure. To cope with and accommodate, the changing and modernizing phenomenon, distance education has been recognised as an effective alternative educational system.

The present investigation is primarily focussed on the personality factors of secondary traditional learners and distance learners. Personality plays a vital role in determining the individual's adjustment in life, and it is on the personalities developed in our educational institutions that national progress and prosperity depends. Education as a significant instrument of desirable social change and advancement, tries to impart those desirable characteristics in the personalities of learners which can facilitate the all-round development of a nation. Besides, the personal character of the citizens of a particular nation not only determines the general ethos of its society, but it influences the attitudes of the individuals with regard to the process of development and modernization itself. It cannot be expected that a society composed of individuals with poorly developed personalities will be able to maintain the progressive trends. At one or the other stage, the progressive tendencies in such societies will be hampered through their interaction with the tradition bound, outmoded individual factors. Thus, the development of appropriate personalities in different modes of educational institutions is of paramount importance and should be appropriately taken care of. The significance of personality is not confined to sphere of national progress only. It is important for an individual's life, his/

her family, in school and society. To know about one's personality is one of the most important tasks of the educationists and psychologists. It provides positive feedback and opens the door of self-realization and self-learning which is the key to accelerating individual's progress.

Keeping in mind the significance of the personality in various walks of human life, it become very important and desirable to study scientifically the personality traits of specific groups. Besides the theoretical and societal significance, the present investigation is significant from the view point of applied angle also.

### OBJECTIVES

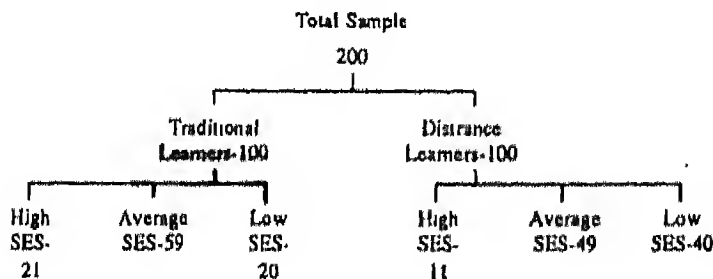
The following were the objectives of the present investigation:

1. To study the psychological characteristics (16 PF) of the traditional and distance learners in a comparative style.
2. To study the socio-economic status of the traditional and distance learners in a comparative style.

### DESIGN OF THE STUDY

#### *Sampling*

In the present investigation the traditional learners and distance learners of Classes XI and XII in the 1989 academic session of the Kumaun Region constituted the sample population. A stratified random sample of educational institutions was drawn from the totality of such Intermediate colleges of the Kumaun Region. Then the distance learners were recorded from the office records of the District Inspector of Schools of Almora, Nainital and Pithoragarh and 200 learners were randomly selected. The entire sampling design was as under



### Tools

For the purpose of investigating the personality characteristics and socio-economic status of the traditional and distance learners the research tools that were deployed included:

1. Socio-Economic Status Scale (Rural and Urban): The SESS Rural and Urban developed and standardized on Indian population by S.P. Kulshreshtha were used.
2. 16 Personality Factor: The 16 PF prepared and standardized for Indian population by S.D. Kapoor was used. The description of these 16 PF is given as below:

Title and Symbol for Designation of the 16 Personality Factors

<i>Symbol</i>	<i>Low Sten Score (1-3)</i>		<i>High Sten Score (8-10)</i>
A	Reserved	vs	Outgoing
B	Less Intelligent	vs	More Intelligent
C	Affected by Feelings	vs	Emotionally Stable
E	Mild	vs	Aggressive
F	Sober	vs	Happy-go-lucky
G	Disregard Rules	vs	Moralistic
H	Shy	vs	Venturesome
I	Tough Minded	vs	Tender Minded
L	Trusting	vs	Suspicious
M	Practical	vs	Imaginative
N	Forthright	vs	Shrewd
O	Secure	vs	Insecure
Q1	Conservative	vs	Experimenting
Q2	Group Dependent	vs	Self-sufficient
Q3	Socially Careless	vs	Socially Precise
Q4	Unfrustrated	vs	Frustrated

### TECHNIQUE OF DATA COLLECTION

Data were collected from six randomly selected traditional schools and six distance-cum-correspondence schools of the Kumaun region. A total of 100 traditional learners and 100 distance learners were selected with the help of administrators, teachers and ministerial staff and administered the 16 PF and SES scales.

### DATA ANALYSIS

In order to examine the difference between the personality factors of the traditional and distance learners, 't' test of significance of difference between

means was employed. Means and SDs of the sten scores of the two groups, i.e. traditional and distance learners, on different personality factors were computed and compared. For studying the socio-economic status of the traditional and distance learners the chi-square test was used.

#### RESULTS AND DISCUSSION

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Table 1 shows the mean scores of various personality factors of the respective mean behaviour of 100 traditional learners and 100 distance learners.

TABLE I						
Personality Factors	Traditional Learners		Distance Learners		t*	Level of Significance
	M	SD	M	SD		
A	5.14	1.87	6.01	1.76	3.29	.01
B	5.55	1.79	5.53	1.83	0.08	NS
C	6.20	1.75	5.18	1.81	4.16	.01
E	5.77	1.72	5.17	1.86	2.45	.05
F	6.49	1.89	5.12	1.79	5.18	.01
G	5.46	1.64	4.56	1.82	3.43	.01
H	5.02	1.95	5.68	1.84	2.49	.05
I	5.67	1.79	6.25	2.03	2.19	.05
L	5.18	1.78	5.91	2.01	2.76	.01
M	5.41	1.97	6.10	2.04	2.44	.05
N	5.08	1.89	4.14	1.87	3.32	.01
O	4.69	1.84	5.56	1.91	3.29	.01
Q1	4.97	1.89	6.01	1.96	3.68	.01
Q2	5.45	1.77	6.28	1.90	3.14	.01
Q3	5.14	1.69	5.69	2.05	2.08	.05
Q4	6.23	1.72	5.45	2.01	2.95	.01

The data presented in Table I reveal that the personality factors which were found statistically significant at .01 level of significance were reserved vs outgoing, affected by feelings vs emotionally stable, sober vs happy-go-lucky, disregard rules vs moralistic, trusting vs suspicious, forthright vs shrewd, placid vs apprehensive, conservative vs experimenting, group dependent vs self-sufficient and relaxed vs tensed. All these significant variations give evidence that the distance learners were found comparatively more outgoing, affected by feelings, sober, disregard rules, suspicious, forthright, experimenting,

self-sufficient and unfrazustrated than the traditional learners. In another five personality factors, namely, mild vs aggressive, shy vs venturesome, tough-minded vs tender-minded, practical vs imaginative and careless of social rules vs socially precise, both the groups differed significantly at .05 level. It indicates that the distance learners were comparatively more humble, venturesome, tender-minded, more imaginative and more socially precise than the traditional learners. In the less intelligent vs more intelligent personality dimensions, both the groups were found more or less similar in their level. These psychological differences between the traditional and distance learners clearly reflect our attention towards the ineffectiveness, unattractiveness and inability (to copy with the various problems) of our traditional system of education. In such a situation one of the most important remedies is to enrich the off-campus learning culture.

TABLE 2  
X<sup>2</sup> Between SES of Total Traditional and Distance Learners

Learners	High SES	Average SES	Low SES	Total
Traditional	11 (16)	49 (54)	40 (30)	100
Distance	21 (16)	59 (54)	20 (30)	100

$$X^2 = 10.70, df = 2$$

A glance at Table 2 reveals that a strong association seems to be existing between the socio-economic status of the traditional and distance learners ( $x^2 = 10.70, p = .01$ ). The association was found statistically significant beyond one per cent of confidence level.

It is clear from the data presented in Table 2 that a high majority of the traditional learners were found from the low socio-economic status groups. In the case of distance learners majority of the sample was observed from the high socio-economic status and average socio-economic status groups. This finding of the present investigation diverts our attention towards the lack of information and social awareness towards the distance mode of education. Our low SES and average SES people do not have any knowledge about the distance mode of education, whereas the distance mode of education is more economical than the traditional system of education (Reddy, 1987). So it becomes our basic duty to provide reliable information, various characteristics and merits of the distance mode of education to our citizens.

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## Book Reviews

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### Jean Piaget

#### Jean Piaget — With Love and Understanding

N. Vaidya, Oxford and I B H Publishing Co. Pvt. Ltd, New Delhi, 1991,  
xxviii + 453, Rs 40.00

**J**EAN PIAGET (1896-1980), a Swiss Psychologist, is an inexhaustible source of ideas. His published work comprises about 50 books and several hundred research papers and articles. Many publications have appeared on him. Piaget has been characterised as "a Zoologist by training, an Epistemologist by vocation and a Logician by method". He is chiefly interested in the theoretical and experimental investigations of the qualitative changes in the cognitive structure occurring in the course of development and in their description in mathematico-logical terms. He has worked on problems like perception, causality, language, moral judgement, object, space, number, time, quantity, motion, speed, geometry, logic and genetic epistemology. He believed that children's questions and highly varied interpretations of their comments go a long way in providing a fruitful line of inquiry or a key to research in

intellectual development. The observation of children's spontaneous and elicited behaviour paved the way for his early foundation of cognitive development and symbolic thought. Piaget visualised with necessary experimental work, how universal child goes about in the business of constructing his own house of knowledge.

The Piagetian world rotates in its entirety on the axis of genetic epistemology. Epistemology aims at investigating those conditions which lead to the possible development of knowledge. It becomes genetic epistemology when it goes back to the root causes of knowledge at the point of its origination using the method of verification. He has emphasised that constructivism is the only possible epistemology where knowledge at a higher level evolves from that of a lower level. Psychological development is similar to biological epigenesis. It implies that there is a causal sequence of events which is characterised by differentiation, complexity and origination. Piaget's theory embraces both empiricism and rationalism, his approach is entirely a synthesis which is called genetic epistemology. However, his contribution is more to the methodological aspects of genetic epistemology rather than to its contents.

Beginning in about 1960, a theory of development of intellectual competence was formulated. It postulated that in the course of development, a child's thought undergoes a series of fundamental changes such that the later ways of thinking are dependent on, yet qualitatively distinct from, the earlier ones and always move in the direction of greater logical consistency. In the final version of the theory, development was viewed not as a linear progression through the stages but as a spiral in which he differentiated forms and contents at one level that are reworked, restructured, integrated or synthesised at a higher level of spiral. His two concepts in the psychology of intellectual development, viz. functional invariants and structures stand out prominently. He has stressed two methods: histo-critical and psycho-genetic in his investigations. The author writes that reasoning by logic and setting up hypotheses by deduction became the distinctive feature of his approach.

Within the framework of genetic epistemology, Jean Piaget describes the intellectual behaviour, from the development point of view, from birth to adolescence in four stages: Sensory-motor stage (10-2 years); Pre-operational stage (2-5 years); Concrete stage (5-11 years) and Formal stage (11-16 years). The fifth stage covering the period (15-20 years) is also hypothesised which relates to individual differences and career commitments. These stages are further divided into sub-stages. The foundation of the practical knowledge or pre-verbal learning is laid during the sensory-motor period. During the second stage the thinking is transductive and self-centred. At the third stage, it is dominated by the reality on the content of the situation. At the formal stage,



the adolescent pupil lives in the world of possibilities and ideas. He is now in a position to set up all sorts of hypotheses and test each of them experimentally. He is able to pick up the various elements of the scientific method.

Piaget's work has evoked mixed reactions. Some critics regard his grouping and INRC structure of formal thought inelastic and trivial. There is some confusion between propositional logic and class logic as well as propositional logic and propositional functional logic. Piaget's tasks were criticised because they are too verbal in character. There is a significant loss of information when the tasks are administered in groups. Piaget also ignored the problem of the study of individual differences in his life time. Vaidya writes that the very language of Piaget as well as of tests is deceptive. There is a need to establish equivalence among various tasks empirically.

Vaidya has taken stock of some psychometric researches based on Piaget's model in English-speaking countries. In an investigation in 1964 on problem solving in Physics among adolescents in Central London, he extracted four factors: attainment, practical, interest in things and adjustment. In another study, Vaidya (1975) investigated the growth of logical thinking during adolescence. The tasks comprised 17 problems, each inhering a continuous chain of reasoning. Some other variables were also studied. The factors extracted included schematic general intelligence, problem orientation, sensing problem, symbolization, testing hypothesis, using constant differences, aspect character, seeing the problem as a whole and intelligence. Based on his researches, Vaidya has suggested the steps in problem solving and logical thinking: appearance, disappearance, and reappearance of the problem situation; vague understanding and classification of the problematic situation; blunt formulation of the problem; trial and error attacks; proposing hypotheses; screening hypotheses and selecting testable hypotheses; testing hypotheses through control experiments; obtaining relevant hypotheses—mathematizing insight into the nature of proof; exploring further varied experimental material as well as varied method of attack; final solution, application, and repetition of the cycle in the face of unknown difficulties (p. 253)

Vaidya found that pupils commit a large number of errors while engaged in problem solving. The mean performance of the pupils rose up, fell down and went up with age again. The subjects after attaining maximum growth in respect of a particular process undergo a decline. It is termed as Hump Effect. Some hypotheses for research have been suggested.

Piaget writes that the principal goal of education is to create men who are capable of doing new things. Moreover, to form minds which can be critical and can verify. Howard E. Gruber and J. Jacques Vaneche (1977) suggested models of teaching which arose out of Piaget's theory. Probably in the absence

of his work, one would have heard little of the Science Curriculum Improvement Project in the USA and the Nuffield Science Projects for youngsters as well as the 5/13 science project in the UK. Vaidya writes that our schools ought to act as centres of inquiry and social change. Teachers have to release the capacities of the pupils by a series of appropriate exposure to a wide range of environmental experience. Backed by his experience as a researcher and teacher, he has suggested some principles of teaching (p. 336) which can be considered for implementation.

Vaidya has suggested some problems for investigations, viz. to study the Piagetian thought right from early childhood to late adolescent stage, keeping in view the statistical assumptions; a study to simplify the picture which consolidates numerous findings of several workers; factor-wise using diverse study samples, tasks and tests; varied ways of scoring data and other variables; to explore the possibility of fifth stage to appear on the scene; research on spontaneous ideas about abstract concepts held by school-going and non-school-going pupils; to determine if the factorial structure of thought, sex-wise, is the same or different on Piagetian tasks presented individually as well as in groups; to develop a mathematical model of school learning comprising three orthogonal axes; stages of thought methodologies of teaching and personality traits of pupils; to synthesise the work of J.P. Guilford and Jean Piaget; the appearance of Spearman's 'g' while interconnecting the psycho-metric and developmental view of intelligence; and how does Indian philosophy see the Piagetian problematique.

In sum, Professor Narendra Vaidya has done a yeoman's job in interpreting Jean Piaget, and so deserves the gratitude of the reader. The book will be of interest to teachers and students of psychology and education and others in the development of scientific thought and method. Probably it would be worthwhile to link the work of Jean Piaget with that of Kurt Lewin when one talks about the interaction between individual and his environment. The book has been subsidised by the National Book Trust and is moderately priced.

P.C. BANSAL



## Elementary School Teacher

### The Elementary School Teacher — A Profile

J.C. Goyal and R.K.Chopra, NCERT, New Delhi 1990, pp. 85.

**T**ODAY, besides imparting instruction in the classroom, the teacher's role in relation to the students, school, colleagues, parents and society is gaining new dimensions. Also for attaining excellence in education, effective, competent and efficient teachers are required. The performance of a teacher on the job is the result of interaction between a number of factors relating to his/her professional, sociological and psychological background. The present study, conducted by the investigators in the Department of Teacher Education, Special Education and Extension Services, NCERT, aims at sketching a profile of an elementary school teacher working in rural and urban areas of educationally backward and advanced states. It also aims at finding out differences, if any, in the status of male and female teachers in the context of location of such elementary schools.

The study consists of four chapters. The first chapter describes the need of the study, its objectives, hypothesis and delimitations. It also gives an overview of researches conducted on the various aspects of the profile of a teacher. The second chapter outlines the design and strategy used in conducting the study. It includes method of selection of the sample, selection and description of tools, collection, tabulation and scoring of data, and statistical techniques employed for their analysis and interpretation. Chapter 3 contains profiles of teachers regarding their general and professional background, socio-economic status, job satisfaction, nine personality variables and attitude towards the teaching profession based on the data collected from a sample of 450 elementary school teachers (223 of rural areas and 227 of urban areas) of 177 schools of four randomly selected states—two educationally backward (Bihar and M.P.) and two educationally advanced (Haryana and Tamilnadu) states and analysed with the help of percentages and t-tests running into 36 tables. The study clearly brings out points of similarities and differences in the profiles of the teachers. It highlights that the teachers in rural and urban areas have some

common characteristics in respect of their attitude towards the teaching profession, extent of job satisfaction, SES and overall personality traits. However, a large number of elementary school teachers in rural areas are comparatively less qualified, have more workload, receive less incentives and more dis-incentives, receive more in-service education, spend a less amount of money on reading material, are more in economic debt, have more membership of professional organisations and less of social and cultural organisations, have lesser empathy and understanding of their colleagues' feelings, are less introvert and have less need achievement tendency but more self-confidence and dominating tendency than their urban counterparts. Similarly, elementary teachers in advanced and backward states show similarity with regard to their attitude towards the teaching profession and socio-economic status. More teachers in backward states belong to SCST, are less qualified, have more workload, receive more incentives and less dis-incentives, have less opportunities for in-service education, have more membership of social and cultural organisations and less of professional organisations, have less job satisfaction, are less ego idealist and have less need achievement tendency but more pessimistic tendency and negatively oriented personality than their counterparts in advanced states.

The last chapter gives a summary of the research study, its findings and conclusions arrived at. It also very vividly brings out implications of the study for State Governments and Central Government as well as other educational agencies concerned with education.

To sum up, this small study running into 85 pages, is self-consistent and has been conducted and reported in a methodical and systematic manner. It clearly brings out points of commonality and differences in the status of elementary teachers working in rural and urban areas of educationally backward and advanced states. The style is simple and narration effective. The study, however, needs replication on a larger sample of states and each state should have representation of more than one district as is done in the present study. Studies relating to other presage variables and Institutional variables need to be conducted because a study of this kind has implications for educational planners and administrators and central and state governments.

N. SABHARWAL

*Contd. from cover ii)*

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